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Section 3

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3. Surface Water and Transport Investigations

3.1 General

Surface water is the primary conduit of PCB transport in the Housatonic River system. The environmental factors that control the concentration and mass of PCBs in surface water will therefore determine, in part, the transport and ultimate fate of PCBs in the Rest of River. To assess the distribution of PCBs and other constituents in surface water, this section provides:

- A description of water quality and hydrologic characteristics in the Housatonic River; and
- A description of the nature and extent of chemical constituents in surface water, including spatial and temporal trends in PCB concentrations, a brief evaluation of the chemical characteristics of PCBs detected in surface water that impact environmental transport and fate, and a brief presentation of data on other chemical constituents.

Section 3.2 describes the surface water sampling and analysis activities that have been conducted since the 1970s at the Housatonic River. Section 3.3 provides the basis for identification of a data subset for more detailed trend evaluations. Section 3.4 presents surface water characteristics and water quality, including an evaluation of suspended solids concentrations. Section 3.5 describes the nature and extent of PCBs in surface water of the Housatonic River. Section 3.6 discusses the relationships between PCB concentrations and other environmental variables. Section 3.7 presents temporal PCB concentration trends. Section 3.8 briefly discusses PCB composition and chemical properties. Section 3.9 summarizes the nature and extent of other chemical constituents in surface water. Finally, Section 3.10 summarizes the conclusions reached from surface water and transport investigations.

3.2 Description of Sampling and Analysis Activities

Numerous surface water investigations have been conducted since the late 1970s to study relevant surface water characteristics as well as the presence, extent, and transport of PCBs and other chemical constituents in the water column of the Housatonic River. Early surface water studies (late 1970s through

1988) were conducted at a few sampling stations spread over large sections of the River in Massachusetts and Connecticut. Since 1988, surface water sampling investigations have primarily focused on the Massachusetts portion of the Housatonic River. A brief summary of surface water investigations/sampling activities is provided below, with details presented in Table 3-1 and more thoroughly described in Appendix A.

3.2.1 1970s to 1988

Surface water sampling in the late 1970s (from 1978 through 1980) was conducted by CAES, in conjunction with CDEP and USGS. The purpose of these sampling activities was to determine the presence and distribution of PCBs in the Housatonic River. To satisfy this objective, three locations were sampled during five high-flow events between 1979 and 1980. Sampling stations included USGS gaging stations in Great Barrington, Massachusetts, as well as Falls Village and Gaylordsville in Connecticut (see Figures 2-1, 2-2, and 3-1 for sampling locations). Water column samples were analyzed for TSS and total and dissolved PCBs. In addition, daily average TSS sampling was conducted over an 18-month period.

Subsequently, on behalf of GE, Stewart collected surface water samples in 1982 at three Massachusetts locations: the Schweitzer/Lenoxdale Bridge, Division Street Bridge (see Figure 3-1), and Andrus Road Bridge (near the Massachusetts/Connecticut border). The objective of the Stewart investigation was to assess the transport of PCBs in the Massachusetts portion of the Housatonic River. Water column samples were collected during three distinct flow events: normal winter conditions (representative of background stream flow), snow melt, and stormflow. Water column samples were analyzed for TSS and total and dissolved PCBs.

The Stewart investigation was followed by a study conducted by CDEP and USGS between 1984 and 1988. Five USGS gaging stations were sampled during five high-flow events. Two of these stations were in Massachusetts (Great Barrington and Ashley Falls) and three were in Connecticut (near Canaan, near Falls Village, and Kent). Water column samples were analyzed for TSS and total and dissolved PCBs.

3.2.2 1989 to 1994

Between 1989 and 1992, Blasland & Bouck, on behalf of GE, collected water column samples on approximately a monthly basis at five locations within the Massachusetts portion of the Rest of River in support of the MCP Phase II investigation. Surface water sampling locations were the New Lenox Road Bridge, Woods Pond Headwaters, Former Housatonic Street Abutment (above Woods Pond Dam), Schweitzer/Lenoxdale Bridge, and Division Street Bridge. In addition, seven locations upstream of the Confluence were sampled, although typically not as frequently. Water column samples were analyzed for chlorophyll-*a*, total and dissolved PCBs, and TSS.

Between 1991 and 1993, LMS, on behalf of GE, collected surface water samples at seven locations within the Massachusetts and Connecticut portions of the Housatonic River. Massachusetts sampling locations were Division Street Bridge, Kellogg Road Bridge, Maple Avenue Bridge, Andrus Road Bridge, while Connecticut sampling locations were Falls Village Route 7 Bridge, Route 133 Bridge, and Glen Road Bridge. Data collected during eight high-flow events were used to develop a PCB fate and transport model. Water column samples were analyzed for total and dissolved PCBs, total organic carbon (TOC), and TSS.

3.2.3 1995 to Present

In 1995 and 1996, on behalf of GE, BBL collected water column samples at as many as 14 locations within the Massachusetts portion of the Housatonic River as part of the Supplemental Phase II/RFI activities (see Table 3-1 for locations). Sampling during this period focused on high-flow conditions. Water column samples collected were analyzed for total and dissolved PCBs and TSS.

The most comprehensive and consistent sampling of the Housatonic River began in 1996 with the MCP Supplemental Phase II investigations. On behalf of GE, BBL conducted monthly or bi-weekly surface water monitoring of TSS, total and dissolved PCBs, particulate organic carbon (POC), and chlorophyll-*a* at variable time periods at more than 10 locations between Pittsfield and Great Barrington in Massachusetts, with most locations occurring upstream of the Schweitzer/Lenoxdale Bridge (see Table 3-1 for listing of locations sampled by year). This sampling effort has continued through the present time.

In addition, on behalf of EPA, Weston has collected surface water samples since 1998 from a number of locations between Pittsfield and the Schweitzer/Lenoxdale Bridge. Water column samples were collected at specified monitoring stations (e.g., New Lenox Road Bridge, Woods Pond Headwaters) along with other discrete sampling locations associated with EPA's human health and ecological risk assessments. This work included routine monthly sampling for approximately one year, high-frequency sampling during six storm events, and collecting discrete samples from specific habitat areas within the system. Additionally, EPA conducted a surface water partitioning study and a bed load sampling study, which are discussed in Section 8. Water column samples were typically analyzed for PCBs, TSS, and chlorophyll-*a*; however, Appendix IX constituents, TOC, grain size of suspended material, and other parameters have also been analyzed.

Finally, in 2000 and 2001, R2 Resource Consultants, Inc. (R2), on behalf of GE, collected water temperature, dissolved oxygen (DO), and pH data from various locations in Reaches 5 and 6 as part of a largemouth bass reproduction and population structure study.

3.3 Identification of Dataset for Trend Analyses

As evidenced by the descriptions of current and previous surface water investigations provided in Section 3.2, the water column of the Housatonic River has been sampled at a variety of locations since the 1970s to satisfy many different objectives. Moreover, surface water investigations over the years have been conducted with different analytical methods, detection limits, data quality assurance/quality control (QA/QC) procedures, and collection methods. In addition, surface water is a highly dynamic medium; therefore, location- and time-specific conditions can have a significant effect on measured results.

Because a consistent and comparable dataset is essential for a meaningful analysis of surface water trends, surface water data collected since 1996 were used to evaluate the nature and extent of PCBs in the Rest of River. These 1996-2002 data provide a current, comprehensive, and reliable dataset for the analysis of spatial trends in PCB concentrations, as well as other relevant chemical parameters, in the Massachusetts portion of the Housatonic River. In addition, to analyze temporal trends in PCB concentrations, the data collected by Blasland & Bouck between 1989 and 1992 were used with the 1996-2002 data, because the

1989-1992 data were collected from comparable locations under a similar program (i.e., monthly sampling). These datasets are discussed in detail in the following sections.

For informational purposes, the historical (pre-1996) data not used in the spatial trend evaluations (which have been reported in previous documents – see Table 3-1 for references) may be summarized as follows:

- Surface water total PCB data collected in the late 1970s through 1988 from the Massachusetts and Connecticut portions of the Housatonic River yielded a maximum detection of 0.6 µg/L collected at Division Street in 1980. Total PCBs were detected in approximately 60% of the samples. For dissolved PCBs, almost 70% of samples collected between the late 1970s and 1988 resulted in non-detect PCBs.

- Between 1991 and 1993, maximum water column PCB concentrations detected were 1.1 µg/L and 0.08 µg/L for total and dissolved PCBs, respectively -- both from samples collected at the Division Street Bridge. (Note that a detection of total PCBs at 21 µg/L at the Division Street Bridge on March 11, 1991 was considered an outlier and thus not included in this statement.) Approximately 50% of samples collected for total PCB analysis and 98% of samples collected for dissolved PCB analysis resulted in non-detect PCBs.

- During high-flow sampling events in 1995 and 1996, approximately 30% of water column samples analyzed for total PCBs and 65% of samples analyzed for dissolved PCBs resulted in non-detects. Maximum PCB concentrations detected were 1.0 µg/L and 0.35 µg/L for total and dissolved PCBs, respectively – both from samples collected at the Division Street Bridge.

All surface water PCB data available from the Housatonic River below the Confluence, including both the data used in the trend analyses and the historical data not used in these analyses, are presented in Appendix B. The GE and EPA databases, which include all historical and recent data, are included in Appendix F. Figures B.1-1 through B.1-3 (Appendix B) depicts all surface water sampling locations.

Based on the datasets identified for trend analyses (as described above), the following sections summarize general surface water characteristics and chemistry, transport patterns of suspended solids, spatial and temporal patterns in PCB concentrations, and the relationships between PCBs and other environmental

variables (e.g., flow, TSS, temperature, etc.) at a number of locations in the Rest of River area. For reference, the water sample locations are shown on Figure 3-1.

3.4 Chemistry of Surface Water

As part of the Housatonic River surface water assessment, samples were collected and analyzed for constituents that help to define the status and health of the aquatic ecosystem and in some cases control the distribution and fate of PCBs and other chemical constituents in surface water. Water quality data collected include field measurements (i.e., pH, temperature, DO, conductance) and laboratory analyses (i.e., nutrients, chemical oxygen demand, biological oxygen demand) for samples collected as part of the monthly and bi-weekly surface water sampling programs. These data are discussed below.

3.4.1 Temperature, pH, DO, and Conductance

Temperature, pH, DO, and/or conductance were periodically measured at several locations between the Dawes/Pomeroy Avenue Bridge, upstream of the Confluence, and the Division Street Bridge. As discussed in Section 3.3, the evaluation of these data is drawn from the 1996-2002 dataset. These data are summarized in Table 3-2. Because the number of samples collected from each location varied greatly over time, results from all years from 1996-2002 were combined to form a more comprehensive dataset, which is summarized by month in Table 3-3. The summary data show that average values and ranges for conductance, pH, DO, and water temperature are, in general, similar among the most frequently sampled locations. The Dawes/Pomeroy Avenue Bridge location, which is representative of upstream conditions for the Rest of River, exhibits, on average, water temperatures generally similar to the other frequently sampled locations, ranging from 0° Celsius (C) in January to approximately 24°C in the summer months (June to August), reflecting the temperate climate at this latitude. Conductance values at Dawes/Pomeroy peak in August (1.0 mS/cm), and pH values are most basic (8.2) in August and most acidic (6.3) in February. A similar pattern is seen among water quality parameters at locations downstream of the Confluence. As summarized in Table 3-3, water temperatures downstream of the Confluence range from 0°C in the winter months to approximately 25°C in the summer months (June to July). Conductance values downstream of the Confluence typically peak in August, and pH values are most acidic (5.7) in the winter months (December to February) and most basic (8.6) in late summer (July to September).

On behalf of GE, R2 collected water temperature, DO, and pH data from locations along the Housatonic River as part of a largemouth bass reproduction and population structure study conducted during 2000 and 2001 (R2, 2002). In 2000, measurements of DO concentrations, pH, conductivity, and water temperature were collected using hand-held digital meters at 13 locations along the River (shown on Figure 3-2). In addition, continuous water temperature recorders were installed at each of the 13 locations and used from May through September 2000. In 2001, temperature recorders were installed at 12 locations from late March or mid-April to mid-October (also shown on Figure 3-2). Nine continuous DO recorders were deployed in three backwater areas (one unit in the main channel and two within the backwater in each area) in June 2001 and maintained through mid-October. These recorders measured DO as well as water temperature and pH. The water temperature data recorded in 2000 and 2001 are summarized by month in Table 3-4, while the DO data from the three backwater areas are provided in Table 3-5. In summary, temperature measurements were similar to results reported during monthly water column monitoring. Average monthly water temperatures reported during the continuous temperature measurement period were highest in the summer months of July and August (maximums of 23°C and 24°C, respectively) and coolest in the early spring (average March temperatures range between 1.7°C and 2.7°C). Water temperatures measured in backwater areas were higher than temperatures measured in the channel proper during comparable months. Average monthly DO concentrations near Woods Pond were generally higher and less variable on average in the main channel (ranging between 4.8 mg/L and 7.7 mg/L) than measured by the middle and near-shore probes in the backwater areas (ranging between 0.2 mg/L and 8.7 mg/L). Average monthly DO concentrations were typically higher in the cooler months of September and October (maximums of 7.7 mg/L and 8.7 mg/L). Measured pH results were relatively consistent during the 5-month sampling period, with average pH readings ranging between 7.2 and 8.4.

3.4.2 Conventional Water Quality Measurements

Between 1996 and 2002, GE and EPA collected monthly surface water samples from multiple locations upstream of and within the Rest of River area and analyzed them for one or more commonly measured water quality parameters, including:

- Alkalinity;
- Ammonia as N;
- Chlorophyll-*a*;
- Cyanide;
- Dissolved organic carbon (DOC);
- 5-day biochemical oxygen demand;
- Hardness;
- Hardness, dissolved;
- Nitrate and nitrite as N;
- Nitrite as N;
- Orthophosphate as P;
- POC;
- Total phosphate as P;
- Sulfide;
- Total Kjeldahl nitrogen (TKN);
- Total dissolved solids;
- TOC; and
- TSS.

The results of these analyses are summarized in Tables 3-6 for inorganic constituents and 3-7 for organic constituents. The most notable trends are increases in nitrate/nitrite, orthophosphate, and total phosphate downstream of the Pittsfield WWTP, generally by a factor of four or more (Table 3-6). Results for alkalinity, 5-day biochemical oxygen demand, dissolved hardness, hardness, nitrite as N, sulfide, and TKN are generally similar among locations. Average ammonia (as N) concentrations are also not significantly different among locations, but a single observance of 3 milligrams per liter (mg/L) measured at the Pittsfield WWTP outfall was notably higher than concentrations both upstream and downstream and was likely due to the influence of the WWTP effluent plume. Cyanide was not detected at any locations within the Rest of River. Like many of the other constituents, total dissolved solids values are consistent from location to location, with the exception of a much higher maximum value of 813 mg/L measured at the Holmes Road Bridge than was observed at the other locations. Average TSS concentrations decrease downstream of Holmes Road Bridge (TSS is further discussed in Section 3.4.3, below). Chlorophyll-*a* data (Table 3-7), as expected, show higher concentrations in the impounded areas

above Woods Pond Dam and Rising Pond Dam, with lower concentrations in the steeper, free-flowing sections of Reach 5. Results for TOC, POC and DOC are generally similar among locations.

3.4.3 Nature and Extent of TSS in Surface Water

PCBs are hydrophobic; in aquatic environments they tend to be associated with sediment and/or suspended particles. Therefore, understanding the behavior of TSS in the Housatonic River is important to understanding the distribution, fate, and transport of PCBs and other hydrophobic constituents. In this section, spatial trends in TSS concentrations in the Housatonic River water column were evaluated using the monthly and bi-weekly data from samples collected by EPA in 1998-1999 and GE between 1996 and 2002 at locations between the Dawes/Pomeroy Avenue Bridge and Great Barrington, Massachusetts. (Data from the Dawes/Pomeroy Avenue Bridge, located upstream of the Confluence, are presented to quantify TSS sources upstream of and entering into the Rest of River area.) These stations (shown on Figure 3-1) consist of the following:

- Dawes/Pomeroy Avenue Bridge;
- Holmes Road Bridge;
- New Lenox Road Bridge;
- Woods Pond Headwaters;
- Schweitzer/Lenoxdale Bridge; and
- Division Street Bridge.

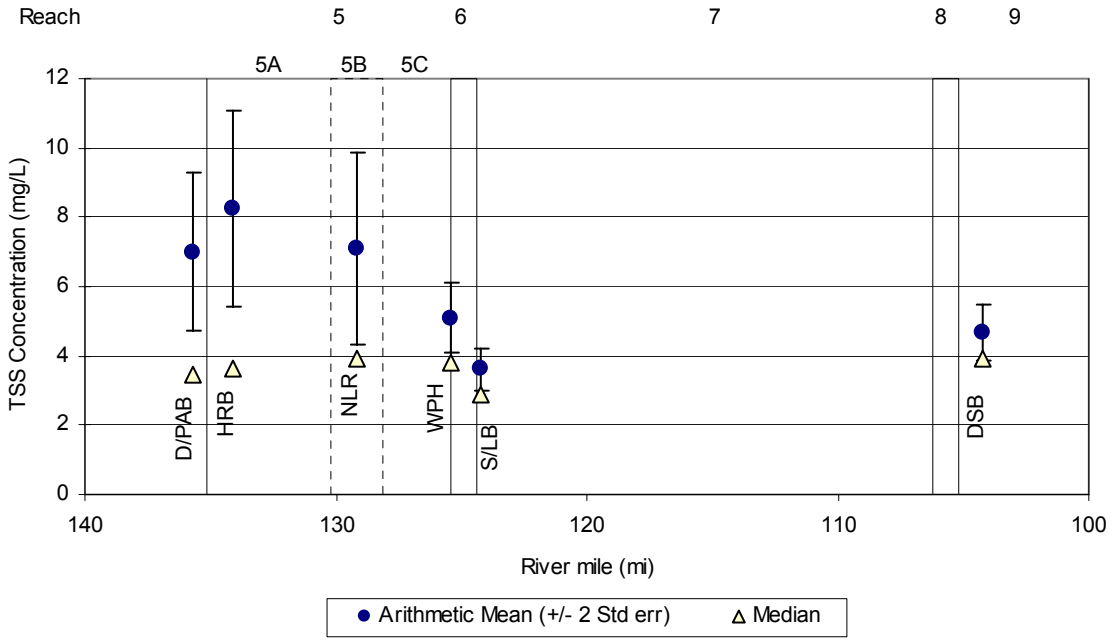
Data from these primary locations are included and summarized by sampling location and year in Table 3-8.

3.4.3.1 Spatial Distribution of TSS in Surface Water

The TSS data collected from the six locations listed above from 1996-2002 comprise a total of 542 surface water samples. As shown in Table 3-8, concentrations ranged from non-detect to 111 mg/L (at New Lenox Road Bridge in 1999). To assess the spatial distribution of TSS, arithmetic means (with +/2 standard errors) and medians for the six locations were plotted, as shown on Figure 3-3 (below).

The arithmetic mean TSS concentrations are generally higher upstream of Woods Pond (Reach 6) and lower downstream of Woods Pond Dam, as shown on Figure 3-3. Within the reach from the Confluence to Woods Pond Dam, average TSS concentrations show a decreasing pattern. The median TSS concentrations are consistently lower than the arithmetic means, indicating that the arithmetic means are increased by a limited number of elevated TSS samples, particularly at the three most upstream locations. The greatest difference between the mean and median is noted at Holmes Road, where the mean TSS concentration is more than double the median. The median values are relatively consistent throughout all sample locations, suggesting that the central tendency of all TSS values is relatively the same. The most notable change in the median TSS concentration occurs downstream of Wood Pond, where the median TSS concentration decreases by almost 25% from the median concentration at the headwaters (Figure 3-3). The decrease across Woods Pond is reflective of the settling of solids from the water column in the impoundment.

Figure 3-3. TSS Concentration in Housatonic River Surface Water

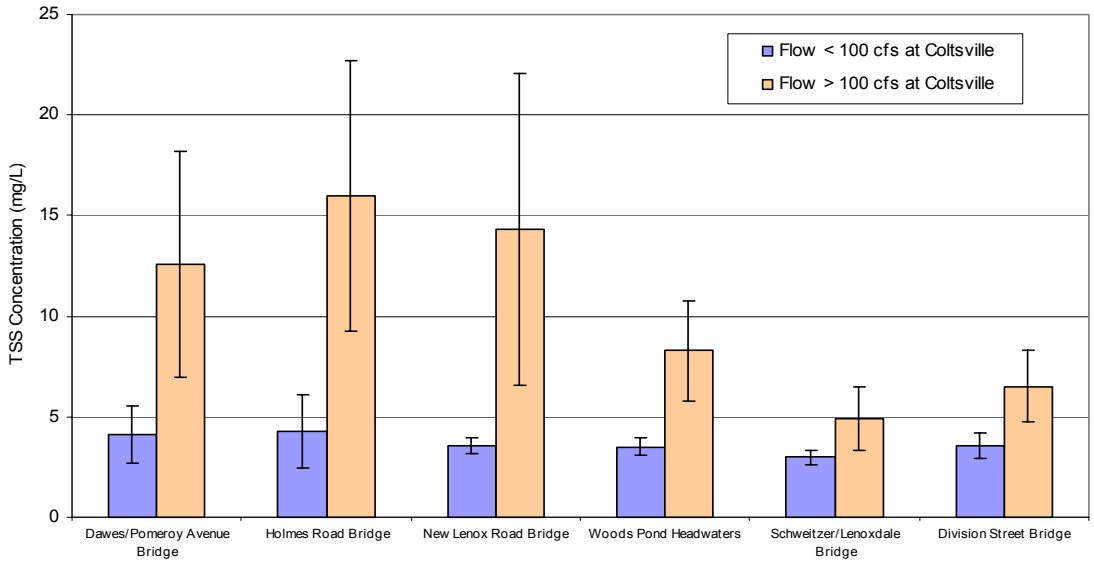


Notes:
Presents all samples collected by GE (1996-2002) and EPA (1998-1999).
D/PAB - Dawes/Pomeroy Avenue Bridge; HRB - Holmes Road Bridge; NLR - New Lenox Road Bridge;
WPH - Woods Pond Headwaters; S/LB -Schweitzer Lenoxdale Bridge; DSB - Division Street Bridge

To assess the relationship between TSS and season, the 1996-2002 surface water data from the sampling stations were compiled and plotted by station and month (Figure 3-4). Figure 3-4 highlights the seasonal component of solids transport in the Housatonic River. In summary, TSS concentrations at sampling locations upstream of the Schweitzer/Lenoxdale Bridge are highest in March, and for the remainder of the year, TSS concentrations are lower and relatively consistent. The higher concentrations observed in the early spring months are likely caused by erosion of soils and/or sediments associated with increases in flow due to snow melt and increased precipitation which skews high the average TSS concentrations in Reaches 5 and 6. As depicted on Figure 3-4, a substantial decrease in TSS in March between the New Lenox Road Bridge and Woods Pond Headwaters is evident (decrease of 60%), and again between the Woods Pond Headwaters and the Schweitzer/Lenoxdale Bridge (decrease of 60%). In months other than March, average TSS values are generally the same upstream and downstream of Woods Pond, around 5.0 mg/L, although TSS is generally higher in January and February at locations upstream of New Lenox Road.

To further assess the relationship between River flow and TSS, the 1996-2002 TSS data were compiled and evaluated for flows above and below 100 cfs, as measured at the Coltsville gaging station (the average measured flow at Coltsville). The results of this evaluation are depicted on Figure 3-5 (below).

Figure 3-5. Arithmetic Mean TSS Concentrations in the Housatonic River



Note:
Presents the arithmetic mean TSS concentration and 2 standard errors for all samples collected by GE (1996-2002) and EPA (1998-1999). Insufficient data collected in the Connecticut portion of the River.

As shown on Figure 3-5, and as would be expected, average TSS concentrations are higher at all locations during times when flow conditions were greater than 100 cfs at Coltsville, compared to TSS concentrations reported when flows were less than 100 cfs. It should be noted that the selection of flow greater than/less than 100 cfs at Coltsville is used due to an observed break in the flow/TSS relationship at 100 cfs at Coltsville (see Section 8 for further explanation). The difference in TSS with flows above and below the 100 cfs flow criterion suggests a positive correlation between flow and TSS. At most locations, TSS concentrations, when plotted against corresponding flow values (Figures 3-6a through 3-6c), are relatively constant at flows less than 100 cfs and tend to show a more positive response to flows greater than 100 cfs. These positive relationships at higher flow suggest the presence of a source of solids (through runoff, resuspension, and/or erosion) upstream of Woods Pond -- most prevalent in Reach 5A -- that is responsive to increased flow. Downstream of Woods Pond, at the Schweitzer/Lenoxdale and Division Street Bridges, TSS does not appear to respond as strongly to higher flows. These observations are most likely due in part to the changes in channel gradient (which control surface water velocities) and the presence of impoundments which act as sediment traps that may dampen downstream fluctuations of TSS.

3.5 Nature and Extent of PCBs in Surface Water

The nature and extent of PCBs in the surface water of the Housatonic River can be affected by a myriad of variables at any given time. However, the relatively extensive Rest of River database allows for a characterization of the distribution of PCBs within the River, both spatially and temporally. This section discusses surface water PCB concentrations observed within the Housatonic River.

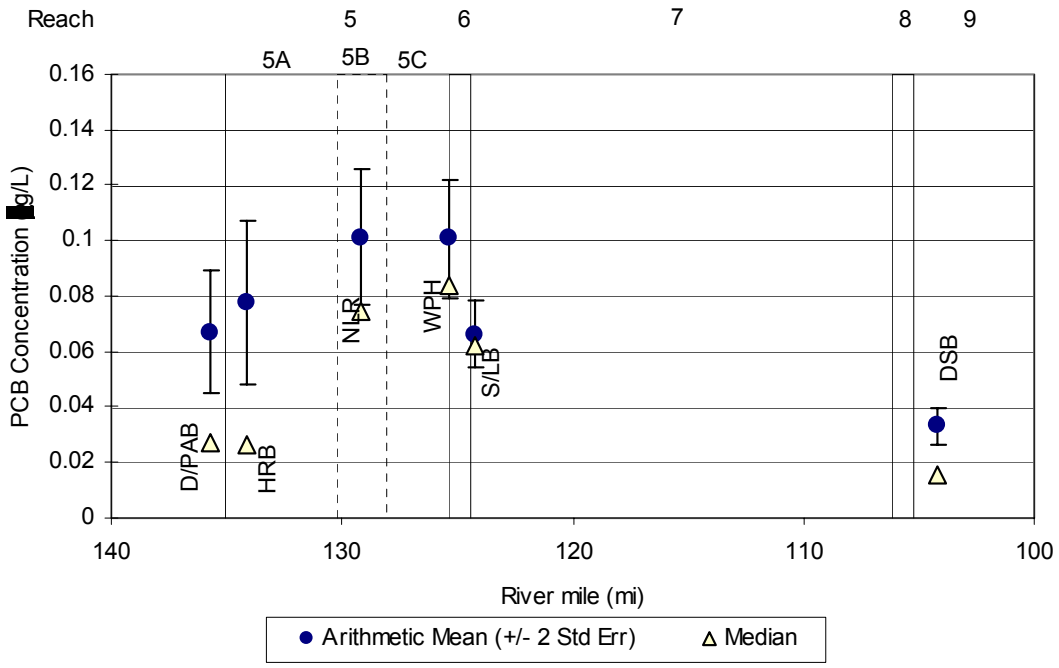
To evaluate the spatial distribution of PCBs in the Housatonic River water column, monthly (or bi-weekly) water column monitoring PCB data collected from 1996 to 2002 between the Dawes/Pomeroy Avenue Bridge and Great Barrington, Massachusetts were evaluated. As noted above, although periodic water column monitoring was conducted at numerous locations within the Housatonic River between 1996 and 2002, the following five locations provide the most consistent, comparable, and broadest sampling record for Reaches 5 through 9, with good spatial coverage between the Confluence and Woods Pond Dam, the stretch of the River that is the primary focus of this RFI Report:

- Holmes Road Bridge;
- New Lenox Road Bridge;
- Woods Pond Headwaters;
- Schweitzer/Lenoxdale Bridge; and
- Division Street Bridge.

Data from the Dawes/Pomeroy Avenue Bridge sampling location (upstream of the Confluence) were also analyzed to provide insight on the PCB concentrations entering the Rest of River. Data from the Connecticut portion of the Rest of River area were insufficient to provide appropriate spatial comparisons. Summary statistics of the PCB data from the six above-mentioned sampling locations, as well as five other locations included to verify spatial trends and relationships, are provided in Table 3-9 and presented by year in Table 3-10.

Between 1996 and 2002, a total of 542 samples were collected from the six primary sample locations, with PCB concentrations ranging from non-detect to a maximum of 0.95 µg/L in a sample collected at the Holmes Road Bridge. Average and median total PCB concentrations are shown by location on Figure 3-7 (below). Highest arithmetic mean and maximum concentrations tend to occur at sampling stations within Reach 5 (i.e., Holmes Road Bridge downstream to the Woods Pond Headwaters), where average PCB concentrations (from the 1996-2002 dataset) range from 0.077 µg/L at the Holmes Road Bridge to 0.10 µg/L at the New Lenox Road Bridge and the Woods Pond Headwaters. The average PCB concentration observed at the Dawes/Pomeroy Avenue Bridge, upstream of the Rest of River, is 0.063 µg/L, slightly lower than the average concentration at the Holmes Road Bridge. Downstream of Woods Pond Dam, average PCB concentrations are similar to concentrations noted above the Confluence; and at the Division Street Bridge, the average PCB concentration is about half of the average concentration noted above the Confluence. As noted on Figure 3-7, median PCB values are lower than the arithmetic means at all locations, indicating that a limited number of elevated surface water PCB samples in each dataset are raising the means above the central tendency values. A slight deviation between the general spatial trend represented by the arithmetic mean and that represented by the median is apparent in the increase in the median PCB concentration of approximately 12% between New Lenox Road and the Woods Pond Headwaters.

Figure 3-7. PCB Concentration in Housatonic River Surface Water

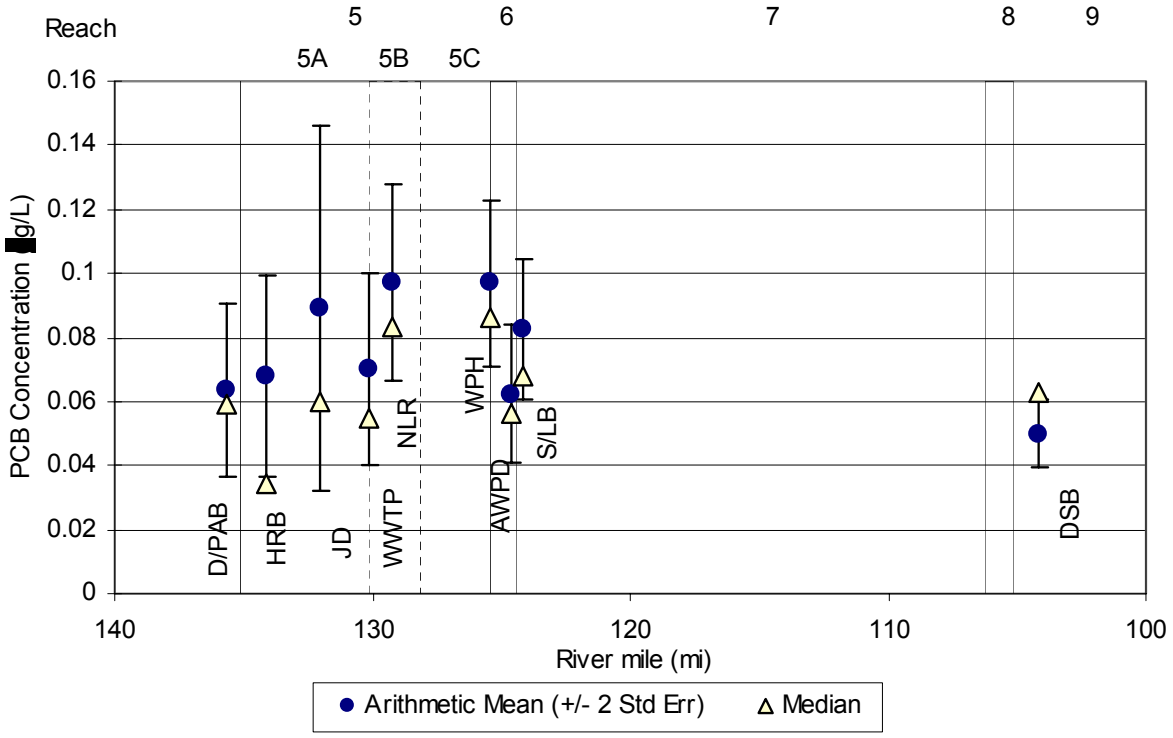


Notes:
Presents all samples collected by GE (1996-2002) and EPA (1998-1999).
D/PAB - Dawes/Pomeroy Avenue Bridge; HRB - Holmes Road Bridge; NLR - New Lenox Road Bridge;
WPH - Woods Pond Headwaters; S/LB -Schweitzer Lenoxdale Bridge; DSB - Division Street Bridge

With respect to dissolved PCBs, the low frequency of detection precludes meaningful analysis of spatial trends. Since 1996, only 16% of samples collected within the Rest of River resulted in detectable concentrations of dissolved PCBs (see Table 3-9).

In 1998 and 1999, a more intensive sampling effort was performed, providing total PCB data from the six above-mentioned stations as well as three additional stations -- near Joseph Drive, near the Pittsfield WWTP, and Woods Pond just upstream of the Woods Pond Dam. The data from this sampling effort are summarized on Figure 3-8 (below).

Figure 3-8. 1998-1999 Average PCB Concentrations



Notes:
Presents all samples collected by GE and EPA (1998-1999).
D/PAB - Dawes/Pomeroy Avenue Bridge; HRB - Holmes Road Bridge; JD - Joseph Drive; WWTP - Pittsfield WWTP; NLR - New Lenox Road Bridge; WPH - Woods Pond Headwaters; AWPD - Above Woods Pond Dam; S/LB -Schweitzer Lenoxdale Bridge; DSB - Division Street Bridge

The 1998-1999 data show the same general trend at the 1996-2002 dataset for the six most consistently sampled locations. However, decreases in arithmetic mean PCB concentrations are seen at the locations near the Pittsfield WWTP and above Woods Pond Dam. These deviations in the 1998-1999 dataset from the general trend observed in the 1996-2002 dataset can be attributed to smaller sample size and increased variability (as evidenced by the error bars). Note that at the Division Street Bridge, the median is higher than the arithmetic mean since the majority of samples were reported as non-detect for PCBs.

3.6 Correlation of PCB Concentration to Other Environmental Variables

Many factors may influence the magnitude and trends of observed PCB concentrations in the Housatonic River water column. The following section presents an evaluation of several of these factors including flow, TSS, TOC, and water temperature. Although each factor is discussed independently of the others

using the monthly and biweekly data collected between 1996 and 2002, covariance exists among the variables that can affect the individual relationships, and is noted when appropriate.

3.6.1 PCB Concentration vs. Flow

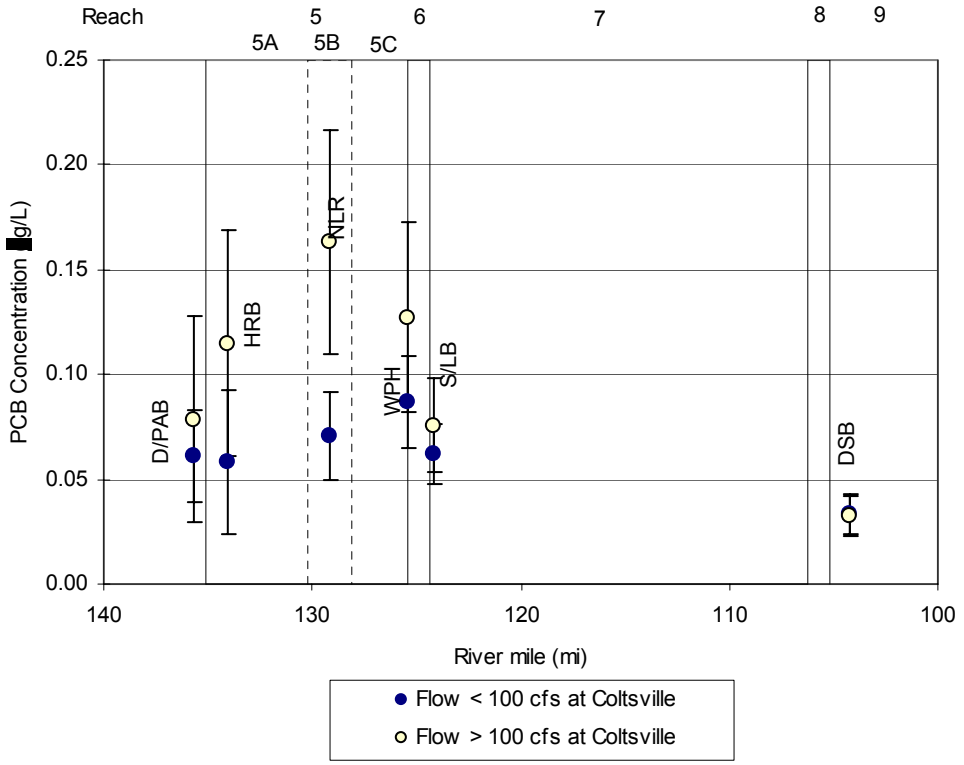
The relationship between PCB transport in a river and fluctuations in flow depends on the mechanisms by which PCBs enter the water column. Where sediments are the predominant source of PCBs to the water column, PCBs can enter the water column in two general ways: 1) chemically, through desorption, diffusion and/or advection of porewater PCBs from sediments; or 2) physically, through resuspension of sediments. At lower flows, the residence time of the water increases, and desorption, diffusion, and biotic activity have a greater impact on water column PCB concentrations. Further, PCB diffusion from sediments is a relatively constant process under a given set of environmental conditions (e.g., water temperature), so an increase in flow will often provide dilution of dissolved PCBs (USGS, 1983). On the other hand, PCB concentrations may increase in response to increases in flow due to the erosion of PCB-containing sediments, and potentially riverbanks, during high-flow events.

Figures 3-9a through 3-9c show the observed relationships between PCB concentration and flows for all samples collected between 1996 and 2002 at the Dawes/Pomeroy Avenue Bridge, Holmes Road Bridge, New Lenox Road Bridge, Woods Pond Headwaters, Schweitzer/Lenoxdale Bridge, and Division Street Bridge. As shown on Figures 3-9a through 3-9c, when flows were greater than 100 cfs at Coltsville, PCB concentrations appear to be positively related with flow (i.e., higher PCBs occur with higher flow) at all locations, with the possible exception of the Schweitzer/Lenoxdale Bridge. The positive correlation with higher flows suggests that sediment scour and resuspension and/or erosion of riverbanks (i.e., physical processes) may be a primary mechanism of PCB transport at flows greater than 100 cfs. With flows less than 100 cfs at Coltsville, a negative relationship is generally observed between PCB concentration and flow (i.e., the highest PCB concentrations tend to occur at the lower flows and tend to decline as flow increases and approaches 100 cfs). These findings suggest that chemical transport of PCBs from the sediment to the water column through desorption, diffusion, and/or advection, rather than resuspension of sediment, may be the primary source of PCBs to the water column at flows less than 100 cfs.

The effect of flow on average PCB concentration by sample location is depicted on Figure 3-10 (below). As noted, average PCB concentrations increase between the Confluence and New Lenox Road at flows

above 100 cfs, increasing by approximately two times between the Dawes/Pomeroy Avenue Bridge and the New Lenox Road Bridge locations. During lower flow conditions, the increase in PCB concentrations over distance is more gradual, increasing approximately 22% from Holmes Road to New Lenox Road and approximately 23% from New Lenox Road to the Woods Pond Headwaters.

Figure 3-10. PCB Concentration Below and Above 100 cfs in the Housatonic River



Notes:
Presents the arithmetic mean PCB concentration and 2 standard errors for all samples collected by GE (1996-2002) and EPA (1998-1999). Insufficient data collected in the Connecticut portion of the River.
D/PAB - Dawes/Pomeroy Avenue Bridge; HRB - Holmes Road Bridge; NLR - New Lenox Road Bridge; WPH - Woods Pond Headwaters; S/LB -Schweitzer Lenoxdale Bridge; DSB - Division Street Bridge

As discussed above, the observed increase in PCB concentration at flows above 100 cfs may be the result of resuspension of PCB-containing sediments and/or erosion of riverbank soils and the increase in PCBs at flows less than 100 cfs (at Coltsville) may be primarily the result of desorption, diffusion, and/or advection of PCBs from the sediment bed. These mechanisms are evidenced by the differing responses at flows greater than or less than 100 cfs from New Lenox Road to the Woods Pond Headwaters. As noted in Section 3.4.3.1, the channel gradient in Reach 5 is reduced downstream of New Lenox Road (resulting in slower velocities). Therefore, at flows greater than 100 cfs, assuming that the observed PCB concentrations in the water column are primarily governed by the suspension of PCB-containing

sediments, PCB concentrations would be expected to decrease as the channel slope and water velocity decrease and PCB-containing sediments settle from the water column. Conversely, at flows less than 100 cfs, when the velocity decreases within this reach, the residence time of the water increases, and as noted above, desorption, diffusion, and biotic activity would be expected to have a greater impact on water column PCB concentrations. In addition, at both lower and higher flows, the decrease in water column PCB concentrations which occurs across Woods Pond, as exhibited by the lower PCB concentrations observed at the Schweitzer/Lenoxdale Bridge, may be attributed to deposition of particulate PCBs to the sediments of Woods Pond. Under both flow regimes, PCB concentrations decrease from the Schweitzer/Lenoxdale Bridge to the Division Street Bridge.

Based on these data, stream flow velocity appears to play a significant role in determining the fate and transport of PCBs within the Housatonic River.

3.6.2 PCB Concentration vs. TSS Concentration

In theory, if sediment resuspension is an important determinant of PCB concentration in surface water, a positive correlation should exist between water column PCBs and TSS. To assess this relationship, plots of PCB versus TSS concentration from 1996 through 2002 were prepared for the Dawes/Pomeroy Avenue Bridge location and the five other consistently sampled locations within the Rest of River (Figures 3-11a through 3-11c). These plots generally indicate positive relationships between PCBs and TSS in the Housatonic River at flows greater than 100 cfs (at Coltsville). At flows less than 100 cfs (at Coltsville), the relationship between TSS and PCBs is less discernible.

PCBs appear to be positively correlated to TSS at most locations, and PCBs and TSS are both correlated in varying degrees to flow. In order to determine an accurate correlation between PCBs and flow, the effect of TSS on the PCB concentration must be taken into account. To assess this issue, the concentrations of PCBs per unit of TSS (i.e., TSS-adjusted PCB concentrations) have been calculated, and these calculated concentrations are plotted against flow on Figures 3-12a through 3-12c. As shown, the calculated PCB concentration per unit of TSS decreases slightly in response to increasing flow at all locations, except at the Schweitzer/Lenoxdale Bridge. The decrease of TSS-adjusted PCB concentrations with flow indicates that at high flows, relatively "clean" sediment is contributing a larger proportion of the increase in transported material than at low flows. This input of cleaner solids may serve to reduce

the transport of and downstream exposure to PCBs over time. Flow alone, however, does not explain a large amount of the variability in the TSS-adjusted PCB concentrations.

The TSS-adjusted PCB results are consistent with the results of both the suspended sediment harvesting and Woods Pond sediment trap studies discussed in the 1996 RFI Report (BBL, 1996) and in Appendix A of this RFI Report. Figure 3-13 shows the relationship between the particulate PCB concentration and time in the vicinity of Woods Pond. TSS-adjusted PCB data collected at the Woods Pond Headwaters and the Schweitzer/Lenoxdale Bridge are within the same range as PCB concentrations from both the suspended sediment harvesting and the sediment trap studies, suggesting that the calculated PCB-per-TSS concentration may be a useful measure of PCB transport and PCBs potentially deposited from the water column.

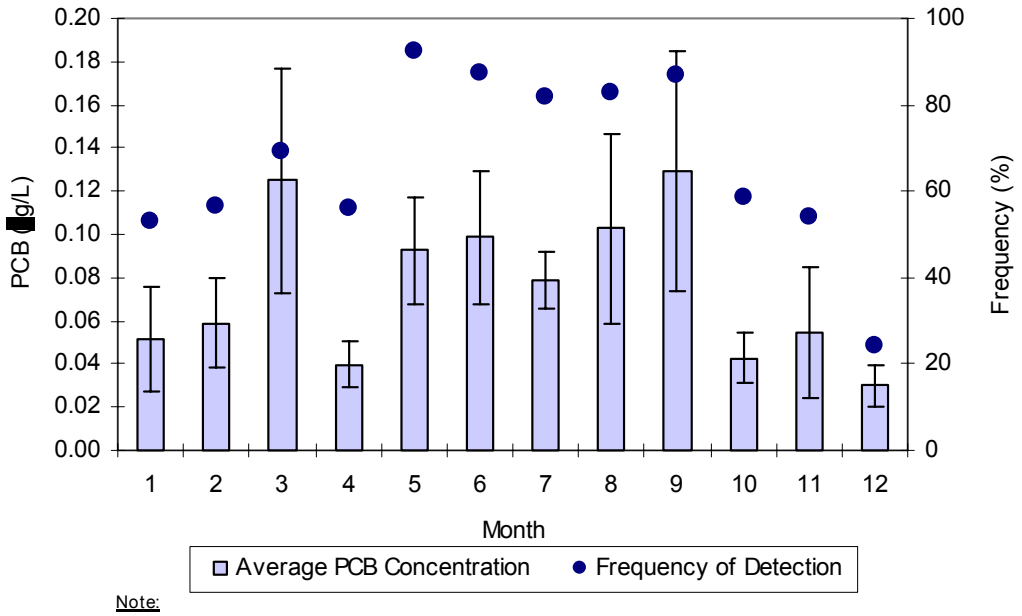
Further evidence of the positive relationships among PCB, TSS, and river flow can be seen in the results of EPA's stormflow monitoring in 1999 (Figures 3-14a to 3-14g). A review of these plots shows a positive relationship between PCB and TSS with increasing flow conditions during the higher-flow events (i.e., flow events 1, 5, 6, and 7). During the larger storm events (e.g., May and September 1999; Figures 3-14a and 3-14f), prominent increases in TSS and PCB concentrations occurred as the River flow rate increased. PCB and TSS concentrations then decreased in response to the decrease in flow rates toward the end of the event. The magnitude of this response was greatest at the Dawes/Pomeroy Avenue Bridge and New Lenox Road locations, where evidence of erosion and resuspension is the strongest. Data from Above Woods Pond Dam indicate much smaller peak concentrations, suggesting the reach between New Lenox Road and Woods Pond Dam serves as a sink for solids and PCBs during high-flow events. The magnitude of the increases in solids and PCBs was variable across the various storm sampling events, although the higher flow events resulted in higher concentrations of solids and PCBs.

3.6.3 PCB Concentration vs. Season/Temperature

Based on partitioning theory, increases in water temperature are expected to increase the rate and extent of desorption of PCBs from sediment. Warmer temperatures also promote increased biological activity (such as sediment organic matter decomposition, algae growth, and benthic fish spawning and feeding) and lower flows, which limit dilution of PCB flux. These factors may produce a positive correlation between surface water PCB concentration and temperature. To assess the general relationship within the

Rest of River, data collected between 1996 and 2002 were compiled and analyzed by month. Shown on Figure 3-15 (below), the relationship between PCB concentration and water temperature is reflected in the general seasonal trend in surface water PCB concentrations in the Rest of River. Total PCB concentrations in surface water samples collected within the Rest of River area are highest during warmer months, with the exception of March, which is associated with higher flows. PCBs were also detected more frequently during warmer months (May to September). Conversely, during the cooler months (October to April [with the exception of March]) PCB concentrations tend to be lower, and detections were less frequent.

Figure 3-15. PCB Concentration and Frequency of Detection in Rest of River Surface Water Samples



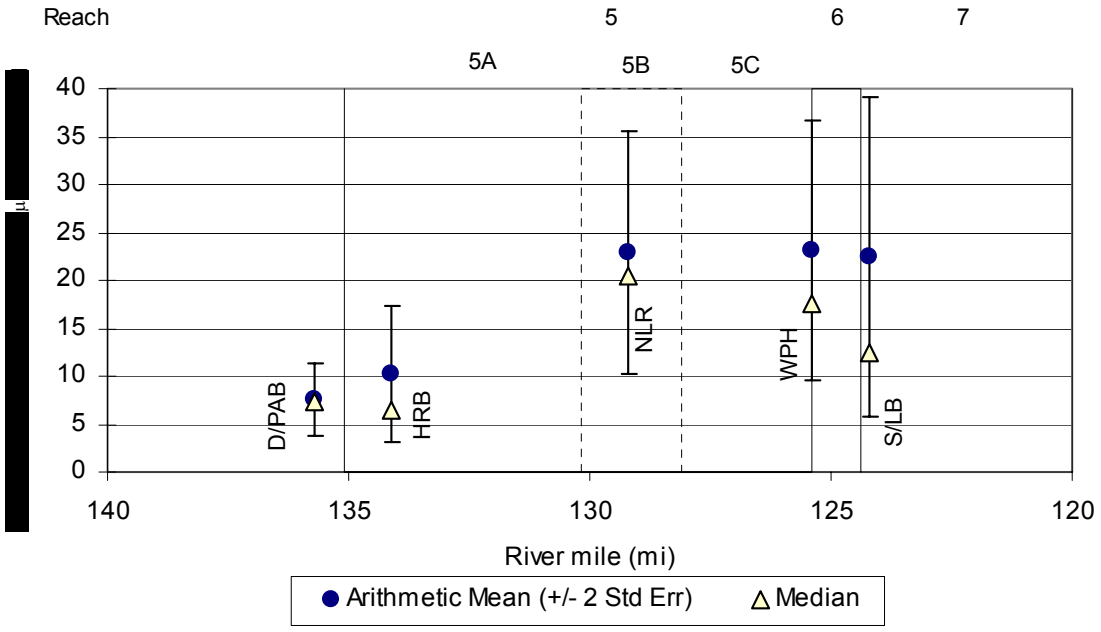
Note:
Presents the arithmetic mean PCB concentration and 2 standard errors for all samples collected by GE (1996-2002) and EPA (1998-1999) within the Rest of River area.

3.6.4 PCB Concentration vs. TOC Concentration

Given the tendency of PCBs to sorb to organic materials, it is expected that PCBs and TOC would be positively correlated. To assess this relationship, surface water data collected by EPA in 1999 (the most recent year when surface water samples were most consistently analyzed for both PCBs and TOC) between the Dawes/Pomeroy Avenue and Schweitzer/Lenoxdale Bridges were analyzed. As shown in

Table 3-7, the 1999 TOC concentrations in the water column were relatively consistent downstream of the Confluence, with averages ranging from 4.2 mg/L at the Schweitzer/Lenoxdale Bridge to 4.9 mg/L at the New Lenox Road Bridge. To further assess the TOC/PCB relationship, a plot of average and median TOC-adjusted PCB concentrations by primary sampling station was generated using the sample-specific PCB results corresponding with these TOC samples (Figure 3-16 below). Consistent with the previous observation of increasing average water column PCB concentrations through Reach 5 (see Section 3.5.1), TOC-adjusted PCB concentrations (the ratio of PCB and TOC concentrations in each sample) increase in Reach 5A and are highest at the New Lenox Road Bridge and Woods Pond Headwaters sampling locations (Figure 3-16, below). The observed difference between the mean and the median is most likely the result of small sample size.

Figure 3-16. TOC-Adjusted PCB Concentration in Housatonic River Surface Water



Notes:
Presents samples collected by EPA (1999).
D/PAB - Dawes/Pomeroy Avenue Bridge; HRB - Holmes Road Bridge; NLR - New Lenox Road Bridge; WPH - Woods Pond Headwaters; S/LB -Schweitzer/Lenoxdale Bridge

Due to the limited number of TOC results collected at each sampling location (eight per location), further analysis was not conducted. Partitioning of PCBs to organic carbon is discussed in more detail in Section 8.

3.6.5 PCBs vs. Chlorophyll-*a*

Chlorophyll-*a* may be an important determinant of PCB concentrations. Because PCBs tend to sorb strongly to organics in the environment such as soil, suspended sediments, bottom sediments, and biotic material, and because algae and other aquatic vegetation have been shown to accumulate PCBs from the water column, the relationship between PCBs and chlorophyll-*a* may indicate PCB sorption to and/or accumulation by algae. The relationships between PCB and chlorophyll-*a* concentrations for the primary sampling stations are shown on Figures 3-17a through 3-17c.

Between 1996 and 2002, PCBs show some positive correlation to chlorophyll-*a* at locations between the Dawes/Pomeroy Avenue Bridge and Woods Pond Headwaters (Figures 3-17a and 3-17b). However, no relationship between PCB and chlorophyll-*a* concentrations is evident at the locations downstream of Woods Pond Dam (Figure 3-17c). The lack of a relationship at the Schweitzer/Lenoxdale Bridge might be attributed to algae and macrophyte growth in Woods Pond sequestering PCBs and returning a portion of them to the sediment bed. Sampling at the Schweitzer/Lenoxdale Bridge may not capture this phenomenon. At the Division Street Bridge, the lack of a relationship between PCB and chlorophyll-*a* may be a result of typically low or non-detect concentrations of PCBs.

3.7 Temporal PCB Concentration Trends in Surface Water

The significant body of historical water column data from the Housatonic River allows for the assessment of PCB trends over time. However, as noted in Section 3.3, changes in sampling methods and detection limits, along with differences in flow and other physical parameters, can add uncertainty to the analysis of temporal trends and need to be considered when interpreting differences in datasets collected over time. To assess changes in PCB concentration over time, the monthly and bi-weekly monitoring data collected between 1989 and 1991 were used for comparison to the more recent (1996-2002) dataset, as discussed in Section 3.3. The 1989-1991 data are shown in Table 3-11, along with the 1996-2002 results for comparison. The 1989-1991 and 1996-2002 PCB data are plotted on Figures 3-18a through 3-18c for the primary stations sampled in both of these time periods, along with best fit lines and the results of regression analyses of temporal trends (performed on log-transformed PCB data due to the fact that the distribution of these data is closer to lognormal than normal). Despite the large within-year variability

shown on Figures 3-18a through 3-18c, PCB concentrations in the Housatonic River surface water at these stations appear to have decreased over time, as noted by the negative slope of the best fit line. In most cases, a downward trend of PCB concentrations is apparent, as well as an increase in the frequency of non-detections. While the results of the regression analyses for all stations except the Dawes/Pomeroy Avenue Bridge indicate that the downward trends over time are significant ($p < 0.05$), the highly variable nature of the data and the low r^2 attest to the weakness of the trend. Nonetheless, the observation of declining water column PCB concentrations in the Rest of River is consistent with source control activities and fate and transport processes occurring over the intervening years, as discussed further in Sections 8 and 9.

Temporal trends of surface water PCB contamination are more visually apparent when the data are averaged and plotted by locations and grouped by years. Data for this analysis included samples collected at both low and higher flows. The distributions of flows during these two time periods were similar (as shown on Figure 3-19a, below), mitigating any impact of flow on the comparison of PCB concentrations. The changes in average PCB concentrations between the 1989-1991 and 1996-2002 datasets at the key sample locations are shown on Figure 3-19b (below). This comparison shows no real change in concentrations at the Dawes/Pomeroy Avenue Bridge. However, at all other locations plotted, although the data are highly variable, declines in water column PCB concentrations are noted. At New Lenox Road, these data suggest that the average PCB concentration decreased by half, from approximately 0.20 µg/L to 0.10 µg/L, during the roughly 9-year period between sampling events. Similarly, at the Schweitzer/Lenoxdale and Division Street Bridges, PCB concentrations dropped by more than 50%, from approximately 0.17 µg/L to 0.07 µg/L and from approximately 0.11 µg/L to 0.035 µg/L, respectively, over the same period of time.

Figure 3-19a. Probability Distribution of Flows on Days of Sampling (1989-1991 and 1996-2002)

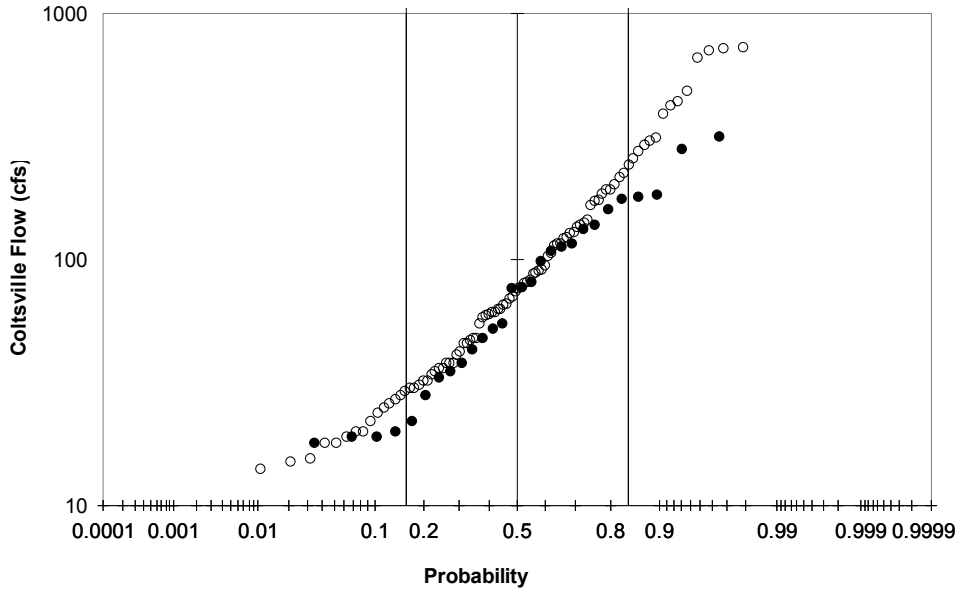
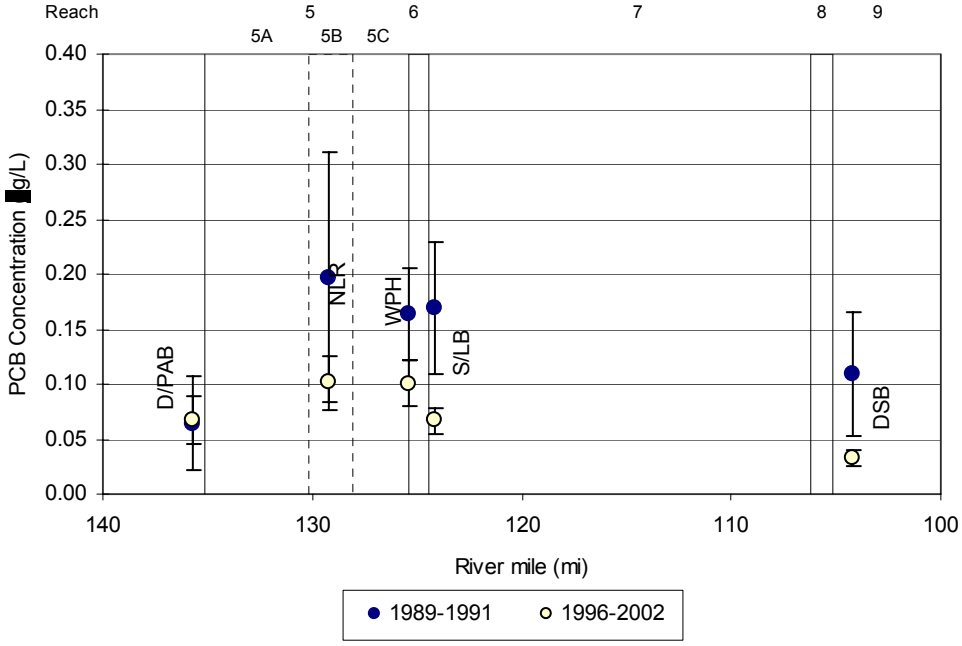


Figure 3-19b. Changes in Average PCB Concentrations Over Time



Notes:
Presents the arithmetic mean PCB concentration and 2 standard errors for all samples collected by GE (1996-2002) and EPA (1998-1999). Insufficient data collected in the Connecticut portion of the River.
D/PAB - Dawes/Pomeroy Avenue Bridge; NLR - New Lenox Road Bridge; WPH - Woods Pond Headwaters; S/LB - Schweitzer Lenoxdale Bridge; DSB - Division Street Bridge

3.8 Chemical Properties and PCB Composition

Chemical characteristics of PCBs determine the behavior of PCBs in the environment. For example, among the 209 PCB congeners, chemical properties such as water solubility and the octanol-water partition coefficient can vary by several orders of magnitude. Therefore, chemical characteristics of the specific PCB congeners found in the water column are important considerations in the assessment of transport and fate of PCBs in surface water, sediment, and biota.

PCB mixtures were produced under the trade name Aroclor, and different Aroclors were composed of various combinations of chlorobiphenyls. As shown in Table 3-12 (below), Aroclors 1254 and 1260 generally contain a greater proportion of higher-chlorinated chlorobiphenyls (i.e., penta-, hexa-, hepta-, octa-, and nona-chlorobiphenyls) than do Aroclors 1242 and 1248. During the period when GE used PCBs at its Pittsfield facility (1932-1977), Aroclor 1260 and, to a lesser extent, Aroclor 1254 were the Aroclors used in GE's manufacturing operations in Pittsfield.

Table 3-12. PCB Quantitation

Chlorobiphenyl	% of Aroclor, by weight			
	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260
Mono-	1	--	--	--
Di-	13	1	--	--
Tri-	45	22	1	--
Tetra-	31	49	15	--
Penta-	10	27	53	12
Hexa-	--	2	26	42
Hepta-	--	--	4	38
Octa-	--	--	--	7
Nona-	--	--	--	1

Reference: Erickson, 1997.

The presence of higher-chlorinated PCB Aroclors (i.e., Aroclor 1254 and Aroclor 1260) is evident in the Housatonic River water column data (Table 3-13, below), with a majority of PCBs quantified as Aroclor 1260. Relative to other PCB mixtures, these Aroclors have a lower solubility, lower volatilization, and higher affinity for organic material including lipids. This suggests that higher-chlorinated PCBs would be

more prone to be transported in the particulate phase and more likely to bioaccumulate than less-chlorinated PCBs (i.e., Aroclors 1242 and 1248), all else being equal.

Table 3-13. Summary of PCB Aroclor Quantification

Reach	N	Mean Aroclor Quantitation by Location (%)		
		Aroclor 1248	Aroclor 1254	Aroclor 1260
Dawes/Pomeroy Avenue Bridge	51	4.2	38.0	53.8
Holmes Road Bridge	53	3.4	33.6	61.4
New Lenox Road Bridge	75	2.1	31.9	63.5
Woods Pond Headwaters	79	2.6	33.5	63.1
Schweitzer/Lenoxdale Bridge	69	1.3	34.9	62.4
Division Street Bridge	28	2.4	32.5	65.1

Notes:
Results determined as the average of the percent Aroclor divided by the sum of the individual Aroclor results.
Includes all data with detectable concentrations of PCB collected between 1996 and 2002.

To further evaluate composition of PCBs in surface water, data from EPA's PCB congener analyses were used to calculate homolog distributions for both total and dissolved PCB congener data. These distributions are shown on Figure 3-20. By comparing Table 3-12 to Figure 3-20, it is apparent that total PCBs in the water column downstream of the Confluence resemble Aroclor 1254 and/or Aroclor 1260.

3.9 Nature and Extent of Other Chemical Constituents in Surface Water

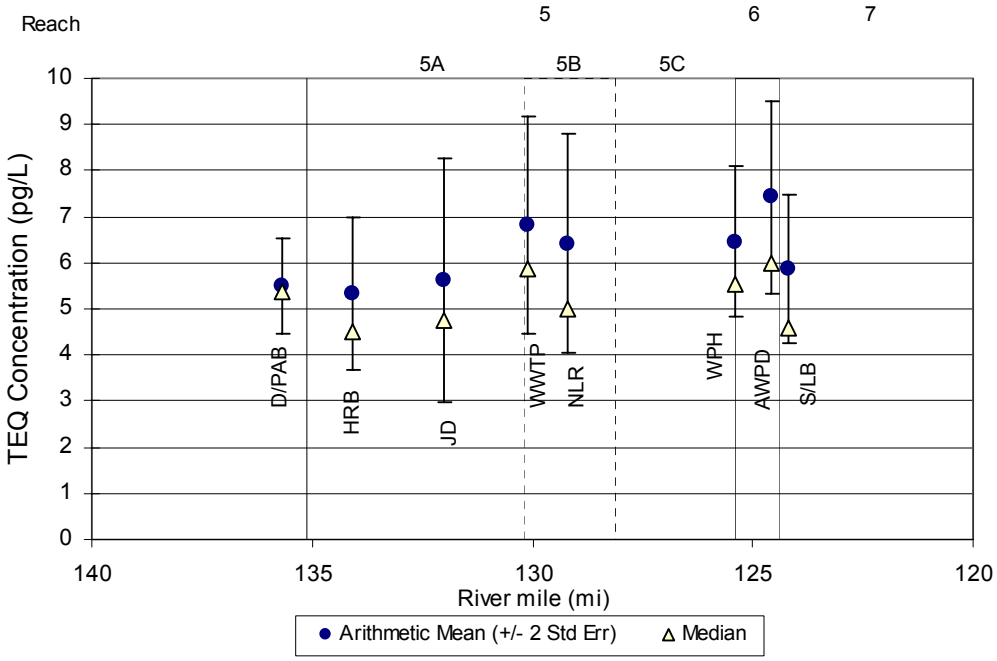
In addition to PCBs, non-PCB constituents were also quantified in surface water samples collected by EPA from 1998 to 2000 at a number of locations in the Rest of River from the Holmes Road Bridge to the Schweitzer/Lenoxdale Bridge. Compounds analyzed for included SVOCs, VOCs, pesticides, herbicides, PCDDs/PCDFs, and metals. Information on frequency of detection and summary statistics on concentrations for these constituents are included in Appendix C.

As discussed in Section 2.6, EPA has advised GE that, based on its human health and ecological screening evaluations, the non-PCB constituents, other than potentially PCDDs/PCDFs, are not key constituents of concern in the Rest of River. As a result, the nature and extent of these constituents in the

Rest of River surface water will not be evaluated further, except for a brief discussion of PCDD/PCDF compounds.

For PCDDs/PCDFs, a review of the data indicates that various PCDD/PCDF compounds were detected in surface water samples. To evaluate these data further, the Toxicity Equivalency Quotient (TEQ) concentration was calculated for each sample using the mammalian Toxicity Equivalency Factors (TEFs) published by the World Health Organization (WHO) (van den Berg et al., 1998) and representing non-detected compounds as one-half the analytical detection limit. In summary, TEQ values calculated for samples collected by EPA during the 1998-99 monthly water column monitoring between the Dawes/Pomeroy Avenue and Schweitzer/Lenoxdale Bridges range from 1.6 pg/L to 23 pg/L (both at Holmes Road Bridge). Arithmetic means range from 5.3 pg/L (Holmes Road Bridge) to 7.4 pg/L (above Woods Pond). Average TEQ concentrations are presented with standard errors on Figure 3-21 (below). Given the relative variability observed at these locations, no distinct trend can be discerned from the data, although it does appear that on average, concentrations are higher downstream of the Pittsfield WWTP than upstream of the WWTP.

Figure 3-21. Average TEQ Concentration at Monthly Surface Water Sampling Locations



Notes:
Presents all samples collected by EPA (1998-1999). Data were not collected downstream of the Schweitzer/Lenoxdale Bridge.
D/PAB - Dawes/Pomeroy Avenue Bridge; HRB - Holmes Road Bridge; JD - Joseph Drive; WWTP - Pittsfield WWTP; NLR - New Lenox Road Bridge; WPH - Woods Pond Headwaters; AWPD - Above Woods Pond Dam; S/LB -Schweitzer Lenoxdale Bridge

In addition, EPA collected discrete samples associated with its risk assessment work. The discrete sampling programs are summarized in Table 3-1. TEQs for the discrete samples range from 1.5 pg/L to 71 pg/L (reported for a sample collected within a backwater area in Reach 5C, approximately 1 mile upstream of Woods Pond), and the arithmetic means by program range from 4.3 pg/L to 12 pg/L.

3.10 Summary

Average water column PCB concentrations generally increase with distance downstream of the Confluence to New Lenox Road, then level off to the Woods Pond Headwaters and decline across Woods Pond Dam. Median PCB concentrations exhibit the same spatial pattern, but are generally lower than the averages, indicating that a limited number of samples with higher PCB concentrations are raising the averages above the central tendency values.

Surface water PCB concentration results were shown to be related to a number of physical parameters, including flow, water temperature, chlorophyll-*a* (upstream of Woods Pond Dam), and most notably TSS. Surface water investigation results show increases in average TSS concentrations among stations located within Reaches 5A and 5B (i.e., between the Confluence and New Lenox Road Bridge) that are especially prominent during flows greater than 100 cfs (at Coltsville). PCB concentrations also increase over this portion of the River, with the increase being greater at higher flows than at lower flows. Together, these observations suggest that erosion of bed sediments and/or riverbanks from specific areas of Reaches 5A and 5B is occurring during higher flows and contributing PCBs to the River. Similar to PCBs, average TSS concentrations generally level off in Reach 5C and decrease across Woods Pond (Reach 6), indicating that suspended solids, along with PCBs, are deposited in this portion of the River. Surface water PCB concentrations are lowest downstream of Woods Pond, while TSS concentrations remain relatively stable, and even increase in some locations. This suggests that additional solids enter the River from the watershed within Reach 7.

Although PCB concentration data show variability that is typical of many environmental datasets, surface water PCB concentrations appear to be decreasing over time at several of the surface water sampling stations. This apparent decline may be the result of various source control activities that have been

conducted in areas upstream of the Confluence. The composition of PCBs in surface water is most consistent with that of Aroclors 1254 and 1260.

Other chemical constituents have also been detected in surface water samples. However, the non-PCB constituents are not the focus of this RFI Report, except for a brief discussion of PCDDs/PCDFs. PCDDs/PCDFs were detected in surface water samples, with TEQs averaging up to 12 pg/L by sampling program and reported up to 71 pg/L in a discrete sample collected from a backwater area within Reach 5C. For PCDD/PCDFs, the calculated TEQ values suggest a slight increase across Reaches 5 and 6.

Section 3 Tables

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Table 3-1
Summary of Surface Water Sampling Activities/Investigations

Year	Description and Purpose	Location	Sample Analyses	Analytical Parameters	Report Citation
CAES, CDEP, and USGS - Cooperative PCB Investigation					
1978-80	CAES, CDEP, and USGS performed water column monitoring studies at three locations to determine the presence and distribution of PCBs in the Housatonic River.	Near Great Barrington, MA	26	Dissolved PCB (13), Flow (16), Total PCB (22), TSS (16)	Frink et al., 1982; Blasland & Bouck, 1991
		Falls Village, CT	18		
		Gaylordsville, CT	7		
Stewart Investigation					
1982	Stewart conducted an analysis of surface water PCB concentrations at three locations on the Housatonic River during three flow events (i.e., winter, snow melt, and storm flow).	Schweitzer/Lenoxdale Bridge	33	Dissolved PCB (40), Flow (40), Total PCB (40), TSS (40)	Stewart, 1982; Blasland & Bouck, 1991
		Division Street Bridge	39		
		Andrus Road Bridge	48		
USGS and CDEP Water Column PCB Investigation					
1984-88	CDEP, in cooperation with USGS, performed water column monitoring during five high-flow events at five USGS gauging stations.	Near Great Barrington, MA	15	Dissolved PCB (30), Flow (25), Total PCB (32), TSS (32)	Kulp, 1991; Blasland & Bouck, 1991
		Ashley Falls, MA	12		
		Near Canaan, CT	9		
		Near Falls Village, CT	12		
		Kent, CT	46		

Table 3-1
Summary of Surface Water Sampling Activities/Investigations

Year	Description and Purpose	Location	Sample Analyses	Analytical Parameters	Report Citation
MCP Phase II Investigation					
1989-92	Between 7/20/89 and 2/6/92, Blasland & Bouck collected water column samples on approximately a monthly basis at 12 locations along the Housatonic River. Samples were collected in support of the MCP Phase II Investigation.	Hubbard Road Avenue Bridge	12	Chlorophyll a (63), Dissolved PCB (136), Total PCB (137), TSS (209), Water Temp (92), Conductance (165), pH (173), Flow (80)	Blasland & Bouck, 1991; BBL, 1996
		Upstream of Unkamet Brook Confluence	6		
		Downstream of Unkamet Brook Confluence	6		
		Newell Street Bridge	6		
		Midpoint Near East Street Area 2 (Boomed)	6		
		Lyman Street Bridge	6		
		Dawes/Pomeroy Avenue Bridge	80		
		New Lenox Road Bridge	83		
		Woods Pond Headwaters	74		
		Former Housatonic Street Abutment	87		
		Schweitzer/Lenoxdale Bridge	95		
		Division Street Bridge	84		

Table 3-1
Summary of Surface Water Sampling Activities/Investigations

Year	Description and Purpose	Location	Sample Analyses	Analytical Parameters	Report Citation
LMS Fate and Transport Model					
1991-93	Between 3/5/91 and 4/23/93, LMS collected composite water column samples during eight specific flow events at a total of seven locations along the Housatonic River. Samples were used for the Ambient Trend Monitoring and PCB Fate and Transport Model.	Andrus Road Bridge	22	Dissolved PCB (53), TOC (89), Total PCB (87), TSS (197), Flow (113)	LMS, 1991; Blasland & Bouck, 1991; BBL, 1996
		Division Street Bridge	216		
		Falls Village Route 7 Bridge	128		
		Kellogg Road Bridge	22		
		Lake Lillinonah at Route 133 Bridge	8		
		Lake Zoar at Glen Road Bridge	8		
		Maple Avenue Bridge	22		
MCP Supplemental Phase II/RFI					
1995	As part of the Supplemental Phase II/RFI activities, BBL collected water column samples at 14 locations under low-flow and high-flow conditions.	Dawes/Pomeroy Avenue Bridge	7	Conductance (28), Dissolved PCB (12), Flow (7), pH (28), Total PCB (28), TSS (28), Water Temp (23)	BBL, 1996
		Division Street Bridge	6		
		Downstream of Unkamet Brook Confluence	4		
		Elm Street Bridge	7		
		Former Housatonic Street Abutment	3		
		Woods Pond Headwaters	3		
		Holmes Road Bridge	3		
		Hubbard Avenue Bridge	7		
		Lyman Street Bridge	4		

Table 3-1
Summary of Surface Water Sampling Activities/Investigations

Year	Description and Purpose	Location	Sample Analyses	Analytical Parameters	Report Citation
MCP Supplemental Phase II/RFI (cont'd)					
		New Lenox Road Bridge	3		
		Newell Street Bridge	7		
		Newell Street Parking Lot Footbridge	7		
		Schweitzer/Lenoxdale Bridge	3		
		Upstream of Unkamet Brook Confluence	4		
	As part of the transport investigation, three sediment traps were placed in Woods Pond in October 1994 and sampled in 1995. Two of three traps were lost or displaced; therefore, they were not sampled. The two lost or displaced traps were returned along with the sampled trap.	Woods Pond	2	PCBs (2), TOC (2), Grain Size (2)	
	Per the Phase II SOW/RFI Proposal, suspended sediment samples and corresponding surface water samples were collected during high-flow conditions from four Lenoxdale locations in October 1995 and five locations (Schweitzer/Lenoxdale Bridge was added) in November 1995.	Dawes/Pomeroy Avenue Bridge	6	Conductance (15), pH (15), Total PCB (15), TSS (15), Water Temp (15)	
		Woods Pond Headwaters	8		
		New Lenox Road Bridge	6		
		Newell Street Bridge	6		
		Schweitzer/Lenoxdale Bridge	4		

Table 3-1
Summary of Surface Water Sampling Activities/Investigations

Year	Description and Purpose	Location	Sample Analyses	Analytical Parameters	Report Citation
MCP Supplemental Phase II/RFI (cont'd)					
1996	BBL conducted water column monitoring as part of the MCP Supplemental Phase II Investigations. Samples were collected on approximately a monthly basis.	Across from EPRI Facility	8	Dissolved PCB (75), Flow (41), Total PCB (141), TSS (106), Water Temp (112)	GE database (November 2002 release)
		Adjacent to Joseph Drive	34		
		Dawes/Pomeroy Avenue Bridge	21		
		Division Street Bridge	22		
		Elm Street Bridge	21		
		Former Housatonic Street Abutment	22		
		Woods Pond Headwaters	22		
		Holmes Road Bridge	21		
		Hubbard Avenue Bridge	21		
		Just Upstream of WWTP	8		
		Lyman Street Bridge	21		
		New Lenox Road Bridge	28		
		Newell Street Bridge	21		
		Newell Street Parking Lot Footbridge	21		
		Schweitzer/Lenoxdale Bridge	21		
		West Branch	10		

Table 3-1
Summary of Surface Water Sampling Activities/Investigations

Year	Description and Purpose	Location	Sample Analyses	Analytical Parameters	Report Citation
MCP Supplemental Phase II/RFI (cont'd)					
	As part of the Supplemental Phase II/RFI activities, BBL collected water column samples at 13 locations under high flow conditions.	Adjacent to Joseph Drive	9	Conductance (14), Dissolved PCB (28), Flow (8), pH (14), Total PCB (28), TSS (28), Water Temp (28)	GE database (November 2002 release)
		Dawes/Pomeroy Avenue Bridge	6		
		Division Street Bridge	9		
		Elm Street Bridge	6		
		Former Housatonic Street Abutment	6		
		Woods Pond Headwaters	6		
		Holmes Road Bridge	6		
		Hubbard Avenue Bridge	6		
		Lyman Street Bridge	6		
		New Lenox Road Bridge	6		
		Newell Street Bridge	6		
		Newell Street Parking Lot Footbridge	6		
		Schweitzer/Lenoxdale Bridge	6		
	Per the Phase II SOW/RFI Proposal, suspended sediment samples and corresponding surface water samples were collected during high-flow conditions from five locations in November 1996.	Dawes/Pomeroy Avenue Bridge	6	Conductance (16), Flow (2), pH (16), Total PCB (16), TSS (16), Water Temp (16)	
		Woods Pond Headwaters	6		
		New Lenox Road Bridge	6		
		Newell Street Bridge	8		
		Schweitzer/Lenoxdale Bridge	6		

Table 3-1
Summary of Surface Water Sampling Activities/Investigations

Year	Description and Purpose	Location	Sample Analyses	Analytical Parameters	Report Citation
MCP Supplemental Phase II/RFI (cont'd)					
1997	BBL conducted water column monitoring as part of the MCP Supplemental Phase II Investigations. Samples were collected on approximately a monthly basis.	Adjacent to Joseph Drive	44	Chlorophyll a (138), Flow (52), POC (138), Total PCB (185), TSS (165), Water Temp (173)	GE database (November 2002 release)
		Andrus Road Bridge	16		
		Bulls Bridge Dam	16		
		Dawes/Pomeroy Avenue Bridge	44		
		Division Street Bridge	46		
		Elm Street Bridge	52		
		Former Housatonic Street Abutment	48		
		Woods Pond Headwaters	43		
		Holmes Road Bridge	45		
		Hubbard Avenue Bridge	48		
		Lyman Street Bridge	64		
		New Lenox Road Bridge	48		
		Newell Street Bridge	24		
		Newell Street Parking Lot Footbridge	28		
		Schweitzer/Lenoxdale Bridge	60		

Table 3-1
Summary of Surface Water Sampling Activities/Investigations

Year	Description and Purpose	Location	Sample Analyses	Analytical Parameters	Report Citation
MCP Supplemental Phase II/RFI (cont'd)					
1998	BBL conducted water column monitoring as part of the MCP Supplemental Phase II Investigations. Samples were collected on approximately a monthly basis until February 1998, after which a bi-weekly sampling schedule was enacted.	Adjacent to Joseph Drive	8	Chlorophyll a (171), Conductance (32), Flow (80), pH (32), POC (172), Total PCB (172), TSS (172), Water Temp (156)	GE database (November 2002 release)
		Dawes/Pomeroy Avenue Bridge	88		
		Division Street Bridge	80		
		Elm Street Bridge	8		
		Former Housatonic Street Abutment	8		
		Woods Pond Headwaters	79		
		Holmes Road Bridge	84		
		Hubbard Avenue Bridge	140		
		Lyman Street Bridge	16		
		New Lenox Road Bridge	80		
		Newell Street Bridge	8		
		Newell Street Parking Lot Footbridge	8		
		Schweitzer/Lenoxdale Bridge	80		

Table 3-1
Summary of Surface Water Sampling Activities/Investigations

Year	Description and Purpose	Location	Sample Analyses	Analytical Parameters	Report Citation
MCP Supplemental Phase II/RFI (cont'd)					
	Between 8/3/98 and 10/27/98, BBL obtained water column split samples from EPA.	Adjacent to Joseph Drive	8	Chlorophyll a (33), Conductance (17), Dissolved PCB (16), pH (17), POC (17), Total PCB (33), TSS (33), Water Temp (17)	GE database (November 2002 release)
		Crane Paper Company (Dalton, MA)	8		
		Dawes/Pomeroy Avenue Bridge	8		
		Elm Street Bridge	8		
		Former Housatonic Street Abutment	8		
		Woods Pond Headwaters	8		
		Holmes Road Bridge	8		
		Hubbard Avenue Bridge	12		
		Lyman Street Bridge	12		
		New Lenox Road Bridge	8		
		Newell Street Bridge	8		
		Newell Street Parking Lot Footbridge	8		
		Pittsfield WWTP	4		
		Schweitzer/Lenoxdale Bridge	8		
		Upstream of Unkamet Brook Confluence	8		
		West Branch Confluence	8		

Table 3-1
Summary of Surface Water Sampling Activities/Investigations

Year	Description and Purpose	Location	Sample Analyses	Analytical Parameters	Report Citation
MCP Supplemental Phase II/RFI (cont'd)					
1999	BBL conducted water column monitoring as part of the MCP Supplemental Phase II Investigations. Samples were collected on a bi-weekly basis at seven key locations.	Dawes/Pomeroy Avenue Bridge	32	Chlorophyll a (61), Conductance (62), Flow (30), pH (62), POC (61), Total PCB (62), TSS (61), Water Temp (61)	GE database (November 2002 release)
		Division Street Bridge	28		
		Woods Pond Headwaters	28		
		Holmes Road Bridge	32		
		Hubbard Avenue Bridge	61		
		New Lenox Road Bridge	32		
		Schweitzer/Lenoxdale Bridge	32		
	Between 3/22/99 and 9/29/99, BBL obtained water column split samples from EPA.	Adjacent to Joseph Drive	30	Chlorophyll a (120), Conductance (118), Dissolved PCB (17), pH (118), POC (120), TOC (17), Total PCB (120), TSS (120), Water Temp (118)	
		Crane Paper Company (Dalton, MA)	30		
		Dawes/Pomeroy Avenue Bridge	30		
		Elm Street Bridge	30		
		Goodrich Pond Tributary	4		
		Woods Pond Headwaters	30		
		Holmes Road Bridge	56		
		Hubbard Avenue Bridge	30		
		Lyman Street Bridge	30		
		New Lenox Road Bridge	30		
		Newell Street Bridge	30		

Table 3-1
Summary of Surface Water Sampling Activities/Investigations

Year	Description and Purpose	Location	Sample Analyses	Analytical Parameters	Report Citation
MCP Supplemental Phase II/RFI (cont'd)					
		Newell Street Parking Lot Footbridge	34		GE database (November 2002 release)
		Pittsfield WWTP	30		
		Schweitzer/Lenoxdale Bridge	30		
		Unkamet Brook Confluence	8		
		Upstream of Unkamet Brook Confluence	22		
		Upstream of Woods Pond Dam	30		
		West Street Branch Confluence	30		
	BBL collected split samples during EPA's sampling of two stormflow events on 5/19/99 and 9/18/99.	Dawes/Pomeroy Avenue Bridge	100	Total PCB (99), TSS (99)	
		New Lenox Road Bridge	98		
2000	BBL conducted water column monitoring as part of the MCP Supplemental Phase II Investigations. Samples were collected at seven key locations.	Dawes/Pomeroy Avenue Bridge	48	Chlorophyll a (96), Conductance (88), Flow (48), pH (88), POC (96), Total PCB (96), TSS (96), Water Temp (96)	GE database (November 2002 release)
		Division Street Bridge	48		
		Woods Pond Headwaters	48		
		Holmes Road Bridge	48		
		Hubbard Avenue Bridge	96		
		New Lenox Road Bridge	48		
		Schweitzer/Lenoxdale Bridge	48		

Table 3-1
Summary of Surface Water Sampling Activities/Investigations

Year	Description and Purpose	Location	Sample Analyses	Analytical Parameters	Report Citation
MCP Supplemental Phase II/RFI (cont'd)					
2001	BBL conducted water column monitoring as part of the MCP Supplemental Phase II Investigations. Samples were collected at seven key locations.	Dawes/Pomeroy Avenue Bridge	46	Chlorophyll a (79), Conductance (71), Flow (39), pH (71), POC (94), Total PCB (94), TSS (94), Water Temp (79)	GE database (November 2002 release)
		Division Street Bridge	46		
		Woods Pond Headwaters	39		
		Holmes Road Bridge	46		
		Hubbard Avenue Bridge	92		
		New Lenox Road Bridge	46		
		Schweitzer/Lenoxdale Bridge	46		
2002	BBL conducted water column monitoring as part of the MCP Supplemental Phase II Investigations. Samples were collected at seven key locations.	Dawes/Pomeroy Avenue Bridge	19	Chlorophyll a (32), Conductance (32), Flow (15), pH (32), POC (40), Total PCB (40), TSS (40), Water Temp (32)	GE database (November 2002 release)
		Division Street Bridge	19		
		Woods Pond Headwaters	19		
		Holmes Road Bridge	19		
		Hubbard Avenue Bridge	38		
		New Lenox Road Bridge	19		
		Schweitzer/Lenoxdale Bridge	19		

Table 3-1
Summary of Surface Water Sampling Activities/Investigations

Year	Description and Purpose	Location	Sample Analyses	Analytical Parameters	Report Citation
Housatonic River High-Flow Sediment Loading Study					
1997	Daily water column composite samples were collected in 1997 to provide suspended solids data in support of the Housatonic River high-flow sediment loading study. The daily composite samples were collected by an automated TSS sampler at several locations along the Housatonic River and at select tributaries.	Woods Pond Headwaters	87	TSS (541)	GE database (November 2002 release)
		Hubbard Avenue Bridge	75		
		Konkapot River	82		
		Rising Pond Dam	72		
		Sackett Brook	76		
		West Branch	68		
		Woods Pond Dam	81		
1998	Daily water column composite samples were collected in 1998 to provide suspended solids data in support of the Housatonic River high-flow sediment loading study. The daily composite samples were collected by an automated TSS sampler at several locations along the Housatonic River and at select tributaries.	Bulls Bridge Dam	12	TSS (102)	
		Woods Pond Headwaters	13		
		Hubbard Avenue Bridge	13		
		Konkapot River	13		
		Rising Pond Dam	12		
		Sackett Brook	13		
		West Branch	13		
		Woods Pond Dam	13		

Table 3-1
Summary of Surface Water Sampling Activities/Investigations

Year	Description and Purpose	Location	Sample Analyses	Analytical Parameters	Report Citation
R2 Largemouth Bass Reproduction and Population Structure Study					
2000-2001	During 2000, continuous water temperature recorders were used to record temperatures at 13 locations from May through September 2000 (hand-held digital meters were also used to measure DO, pH, conductivity, and water temperature). During 2001, temperature recorders were used at 12 locations from late March or mid-April to mid-October, and nine continuous DO recorders were used to record DO, water temperature, and pH in the three backwater areas from June to mid-October 2001.	OM8-Mainchannel	3,403	DO (47,513), pH (47,513), Temperature (186,611)	R2, 2002
		OM8-Middle	5,570		
		OM8-Nearshore	4,601		
		UWP-Mainchannel	5,554		
		UWP-Middle	5,741		
		UWP-Nearshore	5,848		
		UWP2-Mainchannel	5,505		
		UWP2-Middle	5,553		
		UWP2-Nearshore	5,738		
		East Branch	13,838		
		West Branch	13,166		
		Morewood Brook	5,347		
		Holmes Road	13,185		
		Sackett Brook	5,154		

Table 3-1
Summary of Surface Water Sampling Activities/Investigations

Year	Description and Purpose	Location	Sample Analyses	Analytical Parameters	Report Citation
R2 Largemouth Bass Reproduction and Population Structure Study (cont'd)					
		Upstream of New Lenox-Main Channel	2,268		R2, 2002
		Upstream of New Lenox-Backwater	11,837		
		New Lenox Road	7,798		
		Upstream of Mill Brook	6,374		
		Lower Mill Brook	5,312		
		Upper Mill Brook	5,315		
		Downstream of Mill Brook	6,390		
		Roaring Brook	5,275		
		Yokun Brook Outlet	6,333		
		OM8-Backwater	6,403		
		HRDSOM8	6,428		
		Felton Brook	5,311		
		Lower Woods Pond	13,364		

Table 3-1
Summary of Surface Water Sampling Activities/Investigations

Year	Description and Purpose	Location	Sample Analyses	Analytical Parameters	Report Citation
EPA Monthly Water Column, Discrete, and Stormflow Sampling					
1998-99	Weston collected monthly water column samples at 17 locations along the Housatonic River. Samples were collected between 8/98 and 9/99.	Crane Paper Company	185	Appendix IX Pesticides (250), Appendix IX SVOCs (250), Appendix IX VOCs (81), Dioxins/Furans (250), Herbicides (243), Inorganics (275), Metals (250), Metals-Filtered (251), OP Pesticides (250), Organics (253), PAHs (30), PCB Congeners (223), PCBs (250), PCBs-Filtered (251), Conductance (619), Dissolved Oxygen (547), pH (596), Turbidity (349), Water Temp (537)	Weston, 2002
		Hubbard Avenue Bridge	208		
		Unkamet Brook Confluence	176		
		Goodrich Pond Tributary	12		
		Lyman Street Bridge	210		
		Elm Street Bridge	184		
		Newell Street Bridge	185		
		Newell Street Footbridge	222		
		Above the West Branch	186		
		Dawes/Pomeroy Avenue Bridge	197		
		Holmes Road Bridge	277		
		Adjacent to Joseph Drive	187		
		Pittsfield WWTP	174		
		New Lenox Road Bridge	187		
		Woods Pond Headwaters	176		
		Above Woods Pond Dam	166		
		Schweitzer/Lenoxdale Bridge	175		

Table 3-1
Summary of Surface Water Sampling Activities/Investigations

Year	Description and Purpose	Location	Sample Analyses	Analytical Parameters	Report Citation
EPA Monthly Water Column, Discrete, and Stormflow Sampling (cont'd)					
1999	Weston collected stormflow samples at eight locations within the Housatonic River and its tributaries. Samples were collected to assist in the determination of re-suspension and redistribution of PCB-containing sediment and the effects of storms on water quality and hydrodynamics.	Hubbard Avenue Bridge	236	Inorganics (2560), Organics (237), PCB Congeners (24), PCBs (136), PCBs-Filtered (89)	Weston, 2002
		Unkamet Brook	257		
		West Branch Confluence	263		
		Dawes/Pomeroy Avenue Bridge	542		
		Sackett Brook	202		
		New Lenox Road Bridge	654		
		Roaring Brook	214		
		Woods Pond Footbridge	678		
1998-2002	Weston conducted discrete water column sampling at 41 selected locations within the Housatonic River (i.e., channel) and floodplain (i.e., vernal pools). Data were collected during nine designated sampling programs to satisfy human health and ecological risk assessment endpoints.	Program 3: Discrete River Sampling	13	Appendix IX Pesticides (48), Appendix IX SVOCs (18), Appendix IX VOCs (1), Dioxins/Furans (48), Herbicides (16), Inorganics (50), Metals (17), Metals-Filtered (1), OP Pesticides (16), Organics (46), PAHs (0), PCB Congeners (23), PCBs (65), PCBs-Filtered (11), Conductance (6), Dissolved Oxygen (6), Water Temp (6)	Weston, 2002
		Program 8: Non-Routine Surface Water	4		
		Program 15: Sediment Toxicity	54		
		Program 16: Mussel Exposure	14		
		Program 28: Long-Term Remediation Monitoring	38		
		Program 32: Leopard / Wood / Bull Frogs	78		
		Program 77: (Not specified)	37		
		Program 79: Amphibian Vernal Pool Study (Wood)	92		
		Program 82: (Not specified)	30		

Table 3-1
Summary of Surface Water Sampling Activities/Investigations

Year	Description and Purpose	Location	Sample Analyses	Analytical Parameters	Report Citation
Investigation of Other Hazardous Constituents					
1990-91	Water column samples were collected during one high-flow and one low-flow event, respectively, at six locations on the Housatonic River and two in Silver Lake as part of the MCP Phase II Investigation.	Downstream of the Hubbard Avenue Bridge	4	Appendix IX+3 Constituents (14)	Blasland & Bouck, 1991
		Upstream of the Unkamet Confluence	2		
		Downstream of the Unkamet Confluence	2		
		Newell Street Bridge	2		
		Near the Mid-Point of East Street Area 2 (boomed)	2		
		Lyman Street Bridge	2		
1995	As part of the Supplemental Phase II/RFI activities, additional samples were collected by BBL at eight locations (Hubbard Avenue Bridge, Upstream and Downstream of the Unkamet Confluence, Newell Street Bridge, Near the mid-point of East Street Area 2, Elm Street Bridge, Dawes/Pomeroy Avenue Bridge, and Lyman Street Bridge) under low-flow and high-flow conditions.	Downstream of the Hubbard Avenue Bridge	6	Appendix IX+3 VOCs (16), SVOCs (16), Inorganics (16)	BBL, 1996
		Upstream of the Unkamet Confluence	6		
		Downstream of the Unkamet Confluence	6		
		Newell Street Bridge	6		
		Near the Mid-Point of East Street Area 2 (boomed)	6		
		Lyman Street Bridge	6		
		Elm Street Bridge	6		
		Dawes/Pomeroy Avenue Bridge	6		

Notes:

1. Sample/analyses counts based on data as reported in the GE database (November release) and EPA database (November release).
2. Includes field measurements (i.e., temperature, conductance, flow, pH, etc.)

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Table 3-2
Summary of Monthly Water Column Monitoring in Housatonic River
Field Measurement Results -- 1996-2002

Location/ Constituent	Sample Number	Median	Arithmetic Mean	+2 Standard Errors	-2 Standard Errors	Minimum	Maximum
Dawes/Pomeroy Avenue Bridge							
Conductance (mS/cm)	53	0.28	0.30	0.34	0.26	0.0040	1.0
Dissolved Oxygen (mg/L)	12	9.9	9.7	13	6.8	0.092	19
pH (standard units)	52	7.6	7.6	7.7	7.4	6.3	9.3
Temperature (^{o}C)	89	12	12	13	10	0.80	24
Turbidity (NTU)	4	7.4	14	31	< 0	1.1	39
Holmes Road Bridge							
Conductance (mS/cm)	53	0.26	0.29	0.33	0.25	0.0050	0.94
Dissolved Oxygen (mg/L)	13	11	12	15	9.5	7.9	26
pH (standard units)	54	7.8	7.7	7.9	7.5	6.2	10
Temperature (^{o}C)	89	12	12	13	10	0.30	25
Turbidity (NTU)	3	1.4	2.5	5.1	< 0	1.0	5.1
Adjacent to Joseph Drive							
Conductance (mS/cm)	14	0.38	0.39	0.45	0.33	0.20	0.67
Dissolved Oxygen (mg/L)	12	11	13	16	9.7	8.4	27
pH (standard units)	13	7.6	7.6	7.8	7.4	6.8	8.1
Temperature (^{o}C)	34	12	12	14	9.2	0.86	25
Turbidity (NTU)	4	2.9	2.8	3.1	2.4	2.3	3.1
Pittsfield WWTP							
Conductance (mS/cm)	14	0.43	0.48	0.57	0.39	0.34	0.97
Dissolved Oxygen (mg/L)	11	10	12	14	9.2	8.0	23
pH (standard units)	13	7.8	7.6	7.8	7.3	6.6	8.1
Temperature (^{o}C)	17	12	11	15	7.7	0.80	23
Turbidity (NTU)	3	3.6	27	75	< 0	3.2	75
New Lenox Road Bridge							
Conductance (mS/cm)	54	0.29	0.33	0.38	0.28	0.0030	0.93
Dissolved Oxygen (mg/L)	13	9.5	11	14	8.6	7.2	26
pH (standard units)	52	7.6	7.5	7.7	7.3	6.2	9.4
Temperature (^{o}C)	90	11	11	13	9.8	0.50	25
Turbidity (NTU)	3	2.9	2.4	4.3	0.54	0.60	3.7

General Electric Company
Housatonic River - Rest of River
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Table 3-2
Summary of Monthly Water Column Monitoring in Housatonic River
Field Measurement Results -- 1996-2002

Location/ Constituent	Sample Number	Median	Arithmetic Mean	+2 Standard Errors	-2 Standard Errors	Minimum	Maximum
Woods Pond Headwaters							
Conductance (mS/cm)	50	0.27	0.38	0.54	0.22	0.13	4.2
Dissolved Oxygen (mg/L)	10	10	17	27	7.0	5.5	56
pH (standard units)	50	7.6	7.4	7.6	7.3	6.0	8.8
Temperature (^{o}C)	85	12	12	14	10	0.20	25
Turbidity (NTU)	2	19	19	NA	NA	4.1	35
Above Woods Pond Dam							
Conductance (mS/cm)	14	0.42	0.47	0.59	0.35	0.19	1.1
Dissolved Oxygen (mg/L)	13	9	12	15	8.1	5.6	25
pH (standard units)	11	7.7	7.6	7.8	7.3	6.8	8.0
Temperature (^{o}C)	35	13	12	15	9.8	0.40	25
Turbidity (NTU)	3	3.1	3.1	5.8	0.35	0.70	5.4
Schweitzer/Lenoxdale Bridge							
Conductance (mS/cm)	54	0.28	0.31	0.35	0.26	0.022	1.2
Dissolved Oxygen (mg/L)	13	10	14	20	8.2	6.9	46
pH (standard units)	54	7.7	7.5	7.7	7.3	5.5	8.7
Temperature (^{o}C)	89	12	12	13	9.9	0.20	25
Turbidity (NTU)	4	2.6	3.1	4.5	1.8	2.2	5.1
Division Street Bridge							
Conductance (mS/cm)	38	0.25	0.26	0.29	0.23	0.14	0.55
pH (standard units)	38	7.6	7.6	7.9	7.4	5.7	8.9
Temperature (^{o}C)	74	11	12	13	9.7	0.20	25

Notes:

1. Includes all data collected by GE (1996-2002) and EPA (1998-1999) as reported in the GE and EPA databases, respectively.
2. NA = Analysis not conducted due to sample size (n<3) and/or frequency of detection (0%).

Table 3-3
Summary of Monthly Water Column Monitoring in Housatonic River
Field Measurement Results By Month Sampled -- 1996-2002

Location/ Constituent	Month	Sample Number	Median	Arithmetic Mean	+2 Standard Errors	-2 Standard Errors	Minimum	Maximum
Dawes/Pomeroy Avenue Bridge								
Conductance (mS/cm)	1	4	0.24	0.25	0.36	0.13	0.11	0.38
	2	6	0.23	0.25	0.34	0.16	0.11	0.38
	3	5	0.27	0.25	0.37	0.13	0.11	0.43
	4	3	0.20	0.24	0.33	0.15	0.19	0.33
	5	4	0.18	0.17	0.20	0.14	0.13	0.20
	6	4	0.26	0.32	0.46	0.17	0.21	0.53
	7	4	0.35	0.36	0.55	0.17	0.15	0.61
	8	5	0.45	0.52	0.78	0.26	0.28	1.0
	9	4	0.37	0.38	0.55	0.20	0.17	0.58
	10	4	0.26	0.29	0.39	0.19	0.21	0.43
	11	5	0.28	0.29	0.39	0.20	0.21	0.47
	12	5	0.32	0.26	0.39	0.12	0.0040	0.37
Dissolved Oxygen (mg/L)	2	1	NA	15	NA	NA	NA	NA
	4	1	NA	0.092	NA	NA	NA	NA
	5	1	NA	10	NA	NA	NA	NA
	6	1	NA	9.7	NA	NA	NA	NA
	7	1	NA	7.4	NA	NA	NA	NA
	8	2	6.3	6.3	NA	NA	3.9	8.8
	9	2	8.1	8.1	NA	NA	6.2	10
	10	1	NA	19	NA	NA	NA	NA
	11	1	NA	14	NA	NA	NA	NA
	12	1	NA	13	NA	NA	NA	NA
pH (standard units)	1	5	7.3	7.5	8.3	6.6	6.4	8.9
	2	5	7.2	6.9	7.4	6.5	6.3	7.4
	3	5	7.3	7.3	7.8	6.7	6.4	8.0
	4	3	7.7	7.6	8.0	7.3	7.3	7.9
	5	4	7.8	8.1	8.9	7.4	7.6	9.3
	6	4	7.8	7.8	8.0	7.7	7.7	8.0
	7	4	8.0	7.9	8.2	7.6	7.5	8.1
	8	5	7.7	7.7	8.0	7.5	7.5	8.2
	9	3	7.4	7.5	8.2	6.8	7.0	8.1
	10	4	7.8	7.8	8.0	7.6	7.6	8.1
	11	5	7.5	7.4	7.7	7.2	7.1	7.7
	12	5	7.7	7.6	7.8	7.4	7.3	7.9
Temperature (^{o}C)	1	6	1.0	1.9	3.2	0.49	0.80	5.0
	2	8	2.8	3.1	4.3	1.9	0.86	6.4
	3	7	5.0	4.1	5.8	2.3	0.89	7.0
	4	7	10	11	12	9.1	7.6	13
	5	8	16	16	18	13	10	21
	6	8	21	21	22	20	18	23
	7	9	22	22	23	20	19	24
	8	7	20	20	22	18	17	24
	9	9	17	16	19	14	12	23
	10	7	11	11	13	9.2	8.0	15
	11	7	4.0	5.0	6.3	3.8	3.0	7.0
	12	6	2.5	3.2	5.1	1.3	1.0	7.0
Turbidity (NTU)	6	1	NA	2.5	NA	NA	NA	NA
	7	1	NA	12	NA	NA	NA	NA
	8	1	NA	39	NA	NA	NA	NA
	9	1	NA	1.1	NA	NA	NA	NA

Table 3-3
Summary of Monthly Water Column Monitoring in Housatonic River
Field Measurement Results By Month Sampled -- 1996-2002

Location/ Constituent	Month	Sample Number	Median	Arithmetic Mean	+2 Standard Errors	-2 Standard Errors	Minimum	Maximum
Holmes Road Bridge								
Conductance (mS/cm)	1	4	0.24	0.29	0.45	0.13	0.15	0.52
	2	6	0.23	0.24	0.28	0.19	0.15	0.32
	3	5	0.30	0.30	0.46	0.14	0.13	0.59
	4	3	0.26	0.26	0.33	0.19	0.20	0.33
	5	4	0.20	0.20	0.23	0.17	0.17	0.24
	6	4	0.26	0.29	0.40	0.18	0.20	0.44
	7	4	0.33	0.32	0.44	0.19	0.16	0.46
	8	6	0.44	0.48	0.69	0.27	0.24	0.94
	9	3	0.40	0.36	0.50	0.21	0.21	0.46
	10	4	0.25	0.25	0.31	0.19	0.20	0.31
	11	5	0.24	0.26	0.31	0.21	0.22	0.36
	12	5	0.28	0.24	0.37	0.11	0.0050	0.37
Dissolved Oxygen (mg/L)	2	1	NA	16	NA	NA	NA	NA
	4	1	NA	12	NA	NA	NA	NA
	5	1	NA	11	NA	NA	NA	NA
	6	1	NA	8.2	NA	NA	NA	NA
	7	1	NA	8.9	NA	NA	NA	NA
	8	3	8.0	8.9	11	7.1	7.9	11
	9	2	15	15	NA	NA	11	19
	10	1	NA	9.9	NA	NA	NA	NA
	11	1	NA	13	NA	NA	NA	NA
	12	1	NA	26	NA	NA	NA	NA
pH (standard units)	1	5	7.2	7.5	8.4	6.7	6.6	9.1
	2	6	7.0	6.9	7.3	6.5	6.2	7.4
	3	5	7.5	7.4	7.9	6.8	6.5	8.1
	4	3	7.9	7.6	8.2	7.1	7.1	7.9
	5	4	7.9	8.5	9.7	7.3	7.7	10
	6	4	7.9	7.9	8.0	7.7	7.6	8.1
	7	4	8.2	8.2	8.3	8.1	8.0	8.3
	8	6	8.0	7.9	8.2	7.7	7.5	8.3
	9	3	8.1	7.9	8.3	7.4	7.4	8.1
	10	4	7.8	7.8	8.1	7.5	7.4	8.1
	11	5	7.3	7.4	7.8	7.0	6.8	7.9
	12	5	7.8	7.8	8.0	7.5	7.3	8.2
Temperature (^{o}C)	1	6	1.0	1.4	2.5	0.27	0.30	4.0
	2	8	2.8	3.0	4.1	1.9	1.2	6.4
	3	7	5.0	4.4	5.9	2.9	1.3	6.0
	4	7	11	11	12	9.6	8.2	13
	5	8	16	16	18	14	10	21
	6	8	21	21	22	19	17	24
	7	9	23	23	24	21	19	25
	8	8	20	20	22	19	17	24
	9	8	16	16	19	14	13	23
	10	7	11	11	12	9.1	8.1	14
	11	7	5.0	4.7	5.7	3.7	3.0	6.0
	12	6	2.0	2.7	4.2	1.1	1.0	6.0
Turbidity (NTU)	7	1	NA	5.1	NA	NA	NA	NA
	8	1	NA	1.4	NA	NA	NA	NA
	9	1	NA	1.0	NA	NA	NA	NA

Table 3-3
Summary of Monthly Water Column Monitoring in Housatonic River
Field Measurement Results By Month Sampled -- 1996-2002

Location/ Constituent	Month	Sample Number	Median	Arithmetic Mean	+2 Standard Errors	-2 Standard Errors	Minimum	Maximum
Adjacent to Joseph Drive								
Conductance (mS/cm)	1	1	NA	0.38	NA	NA	NA	NA
	2	1	NA	0.30	NA	NA	NA	NA
	3	1	NA	0.67	NA	NA	NA	NA
	4	1	NA	0.26	NA	NA	NA	NA
	5	1	NA	0.20	NA	NA	NA	NA
	6	1	NA	0.43	NA	NA	NA	NA
	7	1	NA	0.45	NA	NA	NA	NA
	8	2	0.48	0.48	NA	NA	0.44	0.51
	9	2	0.37	0.37	NA	NA	0.36	0.37
	10	1	NA	0.31	NA	NA	NA	NA
	11	1	NA	0.37	NA	NA	NA	NA
	12	1	NA	0.39	NA	NA	NA	NA
Dissolved Oxygen (mg/L)	2	1	NA	16	NA	NA	NA	NA
	4	1	NA	11	NA	NA	NA	NA
	5	1	NA	9.9	NA	NA	NA	NA
	6	1	NA	8.4	NA	NA	NA	NA
	7	1	NA	9.1	NA	NA	NA	NA
	8	2	11	11	NA	NA	10	12
	9	2	12	12	NA	NA	9.8	14
	10	1	NA	12	NA	NA	NA	NA
	11	1	NA	12	NA	NA	NA	NA
	12	1	NA	27	NA	NA	NA	NA
pH (standard units)	1	1	NA	6.8	NA	NA	NA	NA
	2	1	NA	7.1	NA	NA	NA	NA
	3	1	NA	7.6	NA	NA	NA	NA
	4	1	NA	8.0	NA	NA	NA	NA
	5	1	NA	7.7	NA	NA	NA	NA
	6	1	NA	7.9	NA	NA	NA	NA
	7	1	NA	8.1	NA	NA	NA	NA
	8	2	7.7	7.7	NA	NA	7.4	8.1
	9	1	NA	7.3	NA	NA	NA	NA
	10	1	NA	7.5	NA	NA	NA	NA
	11	1	NA	7.3	NA	NA	NA	NA
	12	1	NA	8.0	NA	NA	NA	NA
Temperature (^{o}C)	1	2	3.5	3.5	NA	NA	1.0	6.0
	2	3	2.5	2.5	4.3	0.64	0.86	4.0
	3	2	3.4	3.4	NA	NA	1.8	5.0
	4	2	9.7	9.7	NA	NA	9.5	10
	5	3	14	14	17	11	11	16
	6	3	20	20	22	19	19	22
	7	4	21	21	24	19	19	25
	8	3	21	21	22	19	20	22
	9	4	15	15	16	13	13	16
	10	3	11	11	12	11	11	12
	11	3	4.0	4.2	5.6	2.7	3.0	5.5
	12	2	2.4	2.4	NA	NA	1.0	3.7
Turbidity (NTU)	6	1	NA	3.0	NA	NA	NA	NA
	7	1	NA	2.7	NA	NA	NA	NA
	8	1	NA	2.3	NA	NA	NA	NA
	9	1	NA	3.1	NA	NA	NA	NA

Table 3-3
Summary of Monthly Water Column Monitoring in Housatonic River
Field Measurement Results By Month Sampled -- 1996-2002

Location/ Constituent	Month	Sample Number	Median	Arithmetic Mean	+2 Standard Errors	-2 Standard Errors	Minimum	Maximum
Pittsfield WWTP								
Conductance (mS/cm)	1	1	NA	0.41	NA	NA	NA	NA
	2	1	NA	0.35	NA	NA	NA	NA
	3	1	NA	0.73	NA	NA	NA	NA
	4	1	NA	0.40	NA	NA	NA	NA
	5	1	NA	0.97	NA	NA	NA	NA
	6	1	NA	0.48	NA	NA	NA	NA
	7	1	NA	0.45	NA	NA	NA	NA
	8	2	0.49	0.49	NA	NA	0.48	0.50
	9	2	0.42	0.42	NA	NA	0.38	0.45
	10	1	NA	0.34	NA	NA	NA	NA
	11	1	NA	0.41	NA	NA	NA	NA
	12	1	NA	0.41	NA	NA	NA	NA
Dissolved Oxygen (mg/L)	2	1	NA	12	NA	NA	NA	NA
	4	1	NA	14	NA	NA	NA	NA
	5	1	NA	10	NA	NA	NA	NA
	6	1	NA	9.3	NA	NA	NA	NA
	7	1	NA	8.9	NA	NA	NA	NA
	8	2	8.7	8.7	NA	NA	8.0	9.5
	9	2	11	11	NA	NA	9.8	12
	11	1	NA	12	NA	NA	NA	NA
	12	1	NA	23	NA	NA	NA	NA
pH (standard units)	1	1	NA	6.6	NA	NA	NA	NA
	2	1	NA	7.6	NA	NA	NA	NA
	3	1	NA	7.7	NA	NA	NA	NA
	5	1	NA	7.7	NA	NA	NA	NA
	6	1	NA	7.8	NA	NA	NA	NA
	7	1	NA	7.9	NA	NA	NA	NA
	8	2	7.9	7.9	NA	NA	7.9	7.9
	9	2	7.3	7.3	NA	NA	6.8	7.8
	10	1	NA	7.8	NA	NA	NA	NA
	11	1	NA	7.2	NA	NA	NA	NA
	12	1	NA	8.1	NA	NA	NA	NA
Temperature (^{o}C)	1	1	NA	0.80	NA	NA	NA	NA
	2	1	NA	1.6	NA	NA	NA	NA
	3	1	NA	2.5	NA	NA	NA	NA
	4	1	NA	10	NA	NA	NA	NA
	5	1	NA	14	NA	NA	NA	NA
	6	1	NA	19	NA	NA	NA	NA
	7	1	NA	23	NA	NA	NA	NA
	8	2	19	19	NA	NA	19	20
	9	3	15	15	16.86	12.88	13	16
	10	2	11	11	NA	NA	10	11.9
	11	2	4.7	4.7	NA	NA	4	5.4
	12	1	NA	4.3	NA	NA	NA	NA
Turbidity (NTU)	7	1	NA	75	NA	NA	NA	NA
	8	1	NA	3.6	NA	NA	NA	NA
	9	1	NA	3.2	NA	NA	NA	NA
New Lenox Road Bridge								
Conductance (mS/cm)	1	5	0.30	0.29	0.40	0.19	0.16	0.46
	2	6	0.21	0.19	0.28	0.10	0.0030	0.29
	3	5	0.32	0.36	0.62	0.11	0.14	0.84
	4	3	0.27	0.27	0.34	0.21	0.22	0.33

Table 3-3
Summary of Monthly Water Column Monitoring in Housatonic River
Field Measurement Results By Month Sampled -- 1996-2002

Location/ Constituent	Month	Sample Number	Median	Arithmetic Mean	+2 Standard Errors	-2 Standard Errors	Minimum	Maximum
	5	4	0.20	0.23	0.29	0.16	0.18	0.33
	6	4	0.27	0.30	0.40	0.21	0.22	0.45
	7	4	0.35	0.34	0.44	0.23	0.20	0.44
	8	6	0.52	0.57	0.78	0.36	0.27	0.93
	9	3	0.40	0.37	0.45	0.29	0.29	0.42
	10	4	0.27	0.27	0.32	0.23	0.23	0.32
	11	5	0.25	0.28	0.36	0.20	0.22	0.43
	12	5	0.30	0.39	0.57	0.21	0.22	0.72
Dissolved Oxygen (mg/L)	2	1	NA	13	NA	NA	NA	NA
	4	1	NA	13	NA	NA	NA	NA
	5	1	NA	9.3	NA	NA	NA	NA
	6	1	NA	7.2	NA	NA	NA	NA
	7	1	NA	7.8	NA	NA	NA	NA
	8	3	8.0	7.8	8.3	7.4	7.4	8.1
	9	2	13	13	NA	NA	9.5	16
	10	1	NA	11	NA	NA	NA	NA
	11	1	NA	13	NA	NA	NA	NA
	12	1	NA	26	NA	NA	NA	NA
pH (standard units)	1	5	7.1	7.3	8.0	6.6	6.7	8.6
	2	6	6.9	6.8	7.2	6.4	6.2	7.4
	3	5	7.3	7.2	7.8	6.5	6.2	7.9
	4	3	7.8	7.6	8.1	7.1	7.1	7.9
	5	4	7.8	8.2	9.0	7.3	7.7	9.4
	6	3	7.8	7.7	8.0	7.4	7.4	7.9
	7	4	7.8	7.8	7.9	7.7	7.6	8.0
	8	6	7.6	7.7	7.9	7.5	7.4	8.1
	9	3	7.8	7.7	7.9	7.5	7.5	7.8
	10	4	7.8	7.7	7.9	7.5	7.5	7.9
	11	5	7.2	7.4	7.7	7.1	7.1	7.8
	12	4	7.8	7.6	8.0	7.3	7.1	7.9
Temperature (^{o}C)	1	6	0.85	1.2	1.9	0.45	0.70	3.0
	2	8	2.8	2.9	4.0	1.7	0.50	5.8
	3	7	5.0	4.3	5.2	3.3	2.0	5.0
	4	7	10.0	10.0	11	8.8	7.5	13
	5	8	15	15	17	14	11	20
	6	8	20	20	21	19	17	22
	7	9	21	22	23	21	20	25
	8	8	19	20	22	18	17	25
	9	8	15	16	18	13	11	23
	10	7	12	11	12	9.4	8.8	14
	11	8	4.5	4.7	5.4	3.9	3.0	6
	12	6	2.9	3.0	4.3	1.6	1.1	6.0
Turbidity (NTU)	7	1	NA	3.7	NA	NA	NA	NA
	8	1	NA	2.9	NA	NA	NA	NA
	9	1	NA	0.60	NA	NA	NA	NA

Table 3-3
Summary of Monthly Water Column Monitoring in Housatonic River
Field Measurement Results By Month Sampled -- 1996-2002

Location/ Constituent	Month	Sample Number	Median	Arithmetic Mean	+2 Standard Errors	-2 Standard Errors	Minimum	Maximum
Woods Pond Headwaters								
Conductance (mS/cm)	1	2	0.22	0.22	NA	NA	0.20	0.24
	2	6	0.27	0.26	0.32	0.19	0.13	0.36
	3	5	0.33	0.39	0.68	0.10	0.16	0.95
	4	3	0.26	0.27	0.33	0.20	0.21	0.33
	5	4	0.19	0.22	0.30	0.14	0.17	0.33
	6	4	0.25	0.29	0.38	0.19	0.21	0.43
	7	4	0.34	0.32	0.43	0.22	0.18	0.43
	8	6	0.47	0.44	0.53	0.35	0.26	0.57
	9	2	0.32	0.32	NA	NA	0.24	0.39
	10	4	0.27	0.26	0.32	0.20	0.19	0.32
	11	5	0.24	1.01	2.6	< 0	0.17	4.2
	12	5	0.27	0.29	0.37	0.21	0.20	0.43
Dissolved Oxygen (mg/L)	3	1	NA	56	NA	NA	NA	NA
	4	1	NA	19	NA	NA	NA	NA
	5	1	NA	8.8	NA	NA	NA	NA
	6	1	NA	7.1	NA	NA	NA	NA
	7	1	NA	8.7	NA	NA	NA	NA
	8	2	8.4	8.4	NA	NA	5.5	11
	10	1	NA	8.5	NA	NA	NA	NA
	11	1	NA	12	NA	NA	NA	NA
	12	1	NA	33	NA	NA	NA	NA
pH (standard units)	1	2	7.9	7.9	NA	NA	7.3	8.5
	2	6	7.1	7.1	7.7	6.5	6.4	8.4
	3	5	7.3	7.1	7.8	6.4	6.0	8.0
	4	3	7.6	7.5	7.9	7.1	7.1	7.8
	5	4	7.6	7.8	8.5	7.2	7.3	8.8
	6	4	7.7	7.7	7.8	7.6	7.6	7.8
	7	4	7.8	7.8	8.0	7.5	7.5	8.0
	8	6	7.6	7.5	7.8	7.1	6.8	7.9
	9	2	7.4	7.4	NA	NA	7.0	7.8
	10	4	7.5	7.4	7.7	7.1	7.1	7.7
	11	5	7.2	7.4	7.7	7.0	6.8	7.8
	12	5	7.4	7.3	7.8	6.8	6.7	8.0
Temperature (^{o}C)	1	2	0.8	0.8	NA	NA	0.50	1.0
	2	8	2.3	2.5	3.6	1.4	0.20	5.0
	3	7	4.0	4.0	4.8	3.1	2.0	5.0
	4	7	10.0	9.9	11	8.5	7.5	13
	5	8	15	16	18	14	12	21
	6	8	21	20	22	19	18	23
	7	9	22	22	24	21	20	25
	8	8	21	21	22	19	17	25
	9	7	17	17	19	14	12	23
	10	7	12	11	12	9.3	8.5	14
	11	8	4.0	4.4	5.0	3.7	3.0	6
	12	6	2.9	2.9	4.4	1.4	0.40	6.0
Turbidity (NTU)	7	1	NA	4.1	NA	NA	NA	NA
	8	1	NA	35	NA	NA	NA	NA

Table 3-3
Summary of Monthly Water Column Monitoring in Housatonic River
Field Measurement Results By Month Sampled -- 1996-2002

Location/ Constituent	Month	Sample Number	Median	Arithmetic Mean	+2 Standard Errors	-2 Standard Errors	Minimum	Maximum
Above Woods Pond Dam								
Conductance (mS/cm)	2	1	NA	0.37	NA	NA	NA	NA
	3	1	NA	1.13	NA	NA	NA	NA
	4	1	NA	0.33	NA	NA	NA	NA
	5	1	NA	0.19	NA	NA	NA	NA
	6	1	NA	0.42	NA	NA	NA	NA
	7	1	NA	0.42	NA	NA	NA	NA
	8	3	0.48	0.58	0.81	0.35	0.45	0.81
	9	2	0.41	0.41	NA	NA	0.37	0.45
	10	1	NA	0.32	NA	NA	NA	NA
	11	1	NA	0.44	NA	NA	NA	NA
	12	1	NA	0.41	NA	NA	NA	NA
Dissolved Oxygen (mg/L)	2	1	NA	13	NA	NA	NA	NA
	4	1	NA	25	NA	NA	NA	NA
	5	1	NA	8.4	NA	NA	NA	NA
	6	1	NA	6.5	NA	NA	NA	NA
	7	1	NA	6.8	NA	NA	NA	NA
	8	3	7.8	7.4	9.2	5.5	5.6	8.8
	9	2	11	11	NA	NA	8.6	12
	10	1	NA	10	NA	NA	NA	NA
	11	1	NA	13	NA	NA	NA	NA
	12	1	NA	24	NA	NA	NA	NA
pH (standard units)	3	1	NA	7.8	NA	NA	NA	NA
	4	1	NA	8.0	NA	NA	NA	NA
	5	1	NA	7.5	NA	NA	NA	NA
	6	1	NA	7.6	NA	NA	NA	NA
	7	1	NA	7.9	NA	NA	NA	NA
	8	3	7.7	7.6	7.9	7.3	7.3	7.8
	9	2	7.3	7.3	NA	NA	6.8	7.7
	11	1	NA	7.1	NA	NA	NA	NA
Temperature (^{o}C)	1	1	NA	3.0	NA	NA	NA	NA
	2	3	2.5	2.6	5.3	< 0	0.40	5.0
	3	2	3.7	3.7	NA	NA	3.5	4.0
	4	2	9.9	9.9	NA	NA	9.8	10
	5	3	15	15	16	13	13	16
	6	3	22	22	23	21	21	23
	7	4	22	23	24	21	22	25
	8	4	21	21	22	21	21	22
	9	4	16	15	17	14	13	17
	10	3	11	11	12	11	11	12
	11	4	4.0	4.0	4.8	3.2	3.0	5
	12	2	2.2	2.2	NA	NA	2.0	2.4
Turbidity (NTU)	7	1	NA	5.4	NA	NA	NA	NA
	8	1	NA	3.1	NA	NA	NA	NA
	9	1	NA	0.70	NA	NA	NA	NA

Table 3-3
Summary of Monthly Water Column Monitoring in Housatonic River
Field Measurement Results By Month Sampled -- 1996-2002

Location/ Constituent	Month	Sample Number	Median	Arithmetic Mean	+2 Standard Errors	-2 Standard Errors	Minimum	Maximum
Schweitzer/Lenoxdale Bridge								
Conductance (mS/cm)	1	5	0.30	0.28	0.37	0.19	0.16	0.43
	2	6	0.27	0.26	0.32	0.20	0.16	0.37
	3	5	0.35	0.45	0.81	0.09	0.18	1.2
	4	3	0.28	0.28	0.36	0.20	0.21	0.34
	5	4	0.19	0.23	0.32	0.13	0.16	0.37
	6	4	0.26	0.29	0.39	0.20	0.21	0.43
	7	4	0.31	0.30	0.40	0.21	0.18	0.41
	8	6	0.46	0.43	0.51	0.35	0.25	0.55
	9	3	0.38	0.35	0.42	0.27	0.27	0.39
	10	4	0.23	0.19	0.31	0.07	0.022	0.29
	11	5	0.24	0.27	0.33	0.21	0.22	0.38
	12	5	0.27	0.29	0.35	0.22	0.22	0.41
Dissolved Oxygen (mg/L)	1	1	NA	46	NA	NA	NA	NA
	2	1	NA	14	NA	NA	NA	NA
	4	1	NA	26	NA	NA	NA	NA
	5	1	NA	9.5	NA	NA	NA	NA
	6	1	NA	8.3	NA	NA	NA	NA
	7	1	NA	8.2	NA	NA	NA	NA
	8	3	8.5	9.3	13	6.0	6.9	13
	9	1	NA	9.7	NA	NA	NA	NA
	10	1	NA	10	NA	NA	NA	NA
	11	1	NA	12	NA	NA	NA	NA
	12	1	NA	13	NA	NA	NA	NA
pH (standard units)	1	5	7.2	7.4	8.0	6.8	6.8	8.6
	2	6	7.7	7.5	8.2	6.8	6.3	8.6
	3	5	7.1	7.1	7.8	6.5	6.3	8.1
	4	3	7.8	7.6	8.1	7.1	7.1	7.9
	5	4	7.8	7.9	8.5	7.2	7.2	8.7
	6	4	7.9	7.9	8.1	7.7	7.7	8.1
	7	4	7.9	7.9	8.1	7.6	7.6	8.1
	8	6	7.7	7.6	8.0	7.3	7.1	8.2
	9	3	7.6	7.7	8.1	7.2	7.3	8.1
	10	4	7.7	7.6	8.0	7.2	7.0	7.9
	11	5	7.2	7.1	8.2	6.1	5.5	8.2
	12	5	7.8	7.4	8.2	6.5	6.2	8.3
Temperature (^{o}C)	1	6	0.9	1.4	2.4	0.33	0.20	3.0
	2	8	1.8	2.2	3.4	1.0	0.33	5.0
	3	7	4.0	3.8	4.4	3.1	2.0	5.0
	4	7	9.5	10.0	11	8.6	7.8	13
	5	8	15	16	18	14	13	22
	6	8	21	20	22	19	17	22
	7	9	22	23	24	21	20	25
	8	8	21	21	22	20	18	24
	9	8	16	16	18	14	12	22
	10	7	11	11	13	9.2	8.0	15
	11	7	4.0	4.5	5.2	3.7	3.0	6
	12	6	2.0	2.2	3.4	0.9	0.70	5.0
Turbidity (NTU)	6	1	NA	2.4	NA	NA	NA	NA
	7	1	NA	5.1	NA	NA	NA	NA
	8	1	NA	2.2	NA	NA	NA	NA
	9	1	NA	2.8	NA	NA	NA	NA

Table 3-3
Summary of Monthly Water Column Monitoring in Housatonic River
Field Measurement Results By Month Sampled -- 1996-2002

Location/ Constituent	Month	Sample Number	Median	Arithmetic Mean	+2 Standard Errors	-2 Standard Errors	Minimum	Maximum
Division Street Bridge								
Conductance (mS/cm)	1	3	0.22	0.22	0.30	0.13	0.14	0.29
	2	5	0.22	0.23	0.27	0.18	0.15	0.28
	3	4	0.28	0.28	0.39	0.16	0.17	0.37
	4	2	0.26	0.26	NA	NA	0.22	0.30
	5	3	0.19	0.23	0.35	0.10	0.14	0.35
	6	3	0.24	0.24	0.30	0.19	0.20	0.29
	7	3	0.30	0.26	0.37	0.15	0.15	0.32
	8	3	0.41	0.40	0.58	0.23	0.25	0.55
	9	1	NA	0.29	NA	NA	NA	NA
	10	3	0.25	0.24	0.30	0.18	0.19	0.29
	11	4	0.26	0.26	0.30	0.22	0.22	0.30
	12	4	0.27	0.26	0.29	0.23	0.22	0.29
pH (standard units)	1	3	7.6	7.5	7.8	7.2	7.3	7.7
	2	5	8.5	7.7	8.8	6.6	6.3	8.7
	3	4	7.3	7.5	8.5	6.5	6.6	8.9
	4	2	7.3	7.3	NA	NA	7.0	7.6
	5	3	8.2	7.9	8.7	7.1	7.1	8.3
	6	3	7.6	7.5	7.9	7.2	7.2	7.8
	7	3	7.9	7.8	8.1	7.4	7.4	8.0
	8	3	7.8	7.9	8.4	7.5	7.6	8.4
	9	1	NA	8.3	NA	NA	NA	NA
	10	3	7.5	7.6	8.1	7.2	7.3	8.1
	11	4	7.4	7.5	8.1	6.9	6.9	8.3
	12	4	8.0	7.6	8.9	6.3	5.7	8.6
Temperature (^{o}C)	1	4	1.4	1.2	2.1	0.31	0.20	2.0
	2	7	2.5	2.5	3.7	1.3	1.0	5.0
	3	6	4.0	3.8	4.6	3.0	2.0	5.0
	4	6	9.8	9.9	11	8.4	7.7	13
	5	7	15	16	18	14	12	20
	6	7	21	20	22	19	17	22
	7	8	23	23	24	21	19	25
	8	5	21	21	23	19	18	24
	9	6	17	17	20	14	13	22
	10	6	11	11	13	9.3	8.0	14
	11	7	4.0	4.6	5.6	3.5	3.0	7
	12	5	2.0	2.8	4.5	1.0	0.80	6.0

Notes:

1. Includes all data collected by GE (1996-2002) and EPA (1998-1999) as reported in the GE and EPA databases, respectively.
2. NA = Analysis not conducted due to sample size (n<3) and/or frequency of detection (0%).

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Table 3-4
Summary of R2 Temperature Probe Water Column Monitoring in Housatonic River (^{o}C) -- 2000-2001

Location	Month	Sample Number	Median	Arithmetic Mean	Standard Deviation	Minimum	Maximum
East Branch	3	182	1.7	1.7	0.9	0.1	3.7
	4	1200	4.4	5.2	3.0	0.9	12.6
	5	2447	14.7	16.2	4.4	9.3	33.6
	6	2399	18.1	17.7	3.0	10.6	24.2
	7	2480	18.9	19.2	1.7	15.5	24.9
	8	2446	20.0	19.9	2.1	14.0	25.4
	9	2254	16.9	16.7	2.3	10.7	22.5
	10	430	12.1	12.1	2.2	7.8	16.3
West Branch	3	182	2.3	2.3	1.2	0.2	4.5
	4	1200	5.7	6.7	3.7	0.4	14.9
	5	1781	14.7	15.0	1.9	11.5	20.8
	6	2399	19.2	18.9	2.9	11.6	24.9
	7	2480	20.0	20.2	1.8	16.4	26.8
	8	2440	20.7	20.8	2.0	15.5	27.9
	9	2255	17.8	17.6	2.6	10.7	24.1
	10	429	12.1	12.2	2.7	6.7	17.4
Morewood Brook	5	578	15.7	16.2	1.8	13.5	22.2
	6	1200	18.7	18.5	2.1	11.8	23.0
	7	1240	20.7	20.7	1.0	17.4	24.4
	8	1238	20.2	20.6	1.9	16.3	25.9
	9	1091	18.6	18.7	2.0	14.4	23.0
Holmes Road	3	184	2.0	1.9	1.0	0.1	3.9
	4	1200	4.9	5.8	3.2	0.8	13.7
	5	1728	14.3	14.7	1.8	11.5	20.2
	6	2400	18.7	18.2	2.8	11.2	23.9
	7	2480	19.5	19.6	1.7	13.7	25.6
	8	2476	20.2	20.4	1.9	14.9	26.3
	9	2289	17.1	17.0	2.4	11.7	23.2
	10	428	12.3	12.1	2.2	8.1	15.7
Sackett Brook	5	503	11.0	11.3	1.6	8.6	15.6
	6	1200	14.6	14.5	2.3	9.5	19.7
	7	1240	16.0	16.1	1.4	12.0	19.4
	8	1159	16.2	16.3	1.7	11.5	20.4
	9	1052	15.1	15.0	2.4	9.0	20.2
Upstream of New Lenox-Main Channel	5	1214	14.4	14.7	1.7	9.6	18.7
	6	1054	18.7	18.2	2.9	12.0	23.0
Upstream of New Lenox-Backwater	5	2001	15.2	15.5	2.0	12.1	22.8
	6	2358	17.9	18.1	2.8	11.0	24.4
	7	2480	19.4	19.8	1.7	17.1	27.3
	8	2438	19.6	20.0	2.5	15.6	26.6
	9	2223	16.7	16.7	1.8	12.6	23.2
	10	337	13.6	13.0	1.9	6.2	15.5
New Lenox Road	3	147	2.3	2.3	0.9	0.7	3.9
	4	1200	5.1	6.1	3.0	1.0	12.7
	5	1233	14.4	14.7	1.5	12.0	18.4
	6	1199	18.9	18.2	2.7	12.3	22.3
	7	1240	19.6	19.7	1.6	16.5	24.2
	8	1240	20.7	21.0	1.4	18.7	24.7
	9	1200	17.4	17.1	1.8	12.6	21.7
	10	339	13.7	13.5	1.8	9.0	16.2

Table 3-4
Summary of R2 Temperature Probe Water Column Monitoring in Housatonic River (^{o}C) -- 2000-2001

Location	Month	Sample Number	Median	Arithmetic Mean	Standard Deviation	Minimum	Maximum
Upstream of Mill Brook	5	1159	14.7	14.9	1.6	12.4	18.5
	6	1160	19.3	18.5	2.9	12.7	22.9
	7	1240	19.6	19.9	1.6	16.9	24.8
	8	1240	21.1	21.5	1.4	19.2	25.5
	9	1200	17.5	17.4	1.9	13.0	21.8
	10	375	13.7	13.4	1.8	9.7	16.0
Lower Mill Brook	5	626	12.3	12.3	0.9	10.4	14.7
	6	1200	15.0	15.0	1.8	10.9	19.2
	7	1240	15.5	15.8	1.8	12.1	21.5
	8	1196	17.1	16.9	1.9	11.8	20.5
	9	1050	15.5	15.6	2.4	9.3	21.3
Upper Mill Brook	5	629	12.4	12.4	0.9	10.5	14.8
	6	1200	15.1	15.1	1.9	11.0	19.6
	7	1240	15.6	16.0	2.0	11.9	22.1
	8	1195	17.2	17.0	2.0	11.9	20.4
	9	1051	15.6	15.6	2.4	9.4	21.4
Downstream of Mill Brook	5	1176	14.5	14.8	1.7	10.3	18.7
	6	1159	19.3	18.5	3.0	12.5	23.1
	7	1240	19.8	20.0	1.6	16.9	25.1
	8	1240	21.2	21.5	1.4	19.1	25.5
	9	1200	17.5	17.4	1.9	13.0	21.9
	10	375	13.7	13.3	2.0	9.3	16.1
Roaring Brook	5	590	9.6	9.6	1.0	7.6	11.5
	6	1200	13.0	13.2	1.8	8.8	16.8
	7	1240	14.6	14.5	1.1	11.3	17.6
	8	1195	15.0	14.8	1.6	10.4	17.9
	9	1050	13.3	13.5	2.2	7.8	17.9
Yokun Brook Outlet	5	1137	16.5	17.3	2.9	12.3	24.4
	6	1159	20.2	20.2	4.6	13.5	30.9
	7	1240	21.5	22.0	3.9	14.8	32.8
	8	1240	23.0	23.7	2.8	18.9	32.6
	9	1200	17.9	17.9	3.1	10.1	26.1
	10	357	13.4	13.3	3.3	6.7	19.2
OM8-Backwater	5	1138	17.5	17.8	3.0	10.6	26.9
	6	1162	21.4	20.9	4.5	11.2	30.1
	7	1240	22.2	22.8	3.3	16.2	33.4
	8	1240	24.1	24.4	2.8	18.4	33.0
	9	1200	18.8	18.7	3.2	9.6	26.7
	10	423	12.3	12.8	3.1	6.2	19.4
HRDSOM8	5	1166	14.9	15.3	1.8	11.5	20.3
	6	1200	19.7	19.0	3.2	12.7	23.7
	7	1240	20.3	20.6	1.6	17.7	26.8
	8	1240	21.9	22.3	1.4	20.1	26.1
	9	1200	18.0	17.9	1.9	13.5	21.6
	10	382	14.1	13.8	1.6	10.2	16.4
Felton Brook	5	584	12.1	12.1	1.1	9.9	14.6
	6	1200	15.5	15.7	2.3	10.9	21.3
	7	1240	16.3	16.5	1.5	12.9	20.2
	8	1195	17.3	17.2	1.7	12.4	20.5
	9	1092	15.4	15.4	2.8	9.3	22.0
Lower Woods Pond	3	149	1.8	1.7	0.5	0.1	2.5
	4	1200	5.3	6.3	3.5	1.2	13.6
	5	2012	15.7	15.9	1.9	11.9	22.8
	6	2374	19.4	19.3	3.3	12.4	27.3
	7	2465	21.5	21.9	2.0	17.8	29.9
	8	2470	22.7	22.6	2.9	16.0	31.0
	9	2265	18.9	18.8	2.6	11.9	25.4
	10	429	13.8	14.0	2.0	10.1	18.2

Table 3-4

Summary of R2 Temperature Probe Water Column Monitoring in Housatonic River (^{o}C) -- 2000-2001

Location	Month	Sample Number	Median	Arithmetic Mean	Standard Deviation	Minimum	Maximum

Note:

1. Includes all data collected by R2 (5/1/2000 - 10/11/2001).

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Table 3-5
Summary of R2 Dissolved Oxygen Probe Water Column Monitoring in Housatonic River -- 2001

Location	Month	Sample Number	Median	Arithmetic Mean	Standard Deviation	Minimum	Maximum
Dissolved Oxygen (mg/L)							
OM8-MAINCHANNEL	6	781	7.2	7.3	0.7	5.9	9.7
	7	1401	7.0	7.0	1.0	3.1	10.2
	8	692	4.6	4.9	1.1	2.5	7.8
	9	24	7.6	7.7	0.6	7.0	9.1
	10	505	6.9	7.1	0.7	6.2	9.0
OM8-MIDDLE	6	834	0.0	1.4	2.7	0.0	11.4
	7	1397	4.0	3.8	2.7	-0.1	10.1
	8	1443	1.0	1.6	1.7	-0.1	7.8
	9	1391	3.1	3.2	3.0	-0.2	12.7
	10	505	9.3	8.7	2.3	2.2	13.0
OM8-NEARSHORE	6	1074	6.0	6.2	3.0	0.0	15.3
	7	881	6.5	6.7	3.5	0.6	16.3
	8	750	5.5	6.0	4.3	0.1	16.8
	9	1391	6.3	6.5	3.7	0.0	13.6
	10	505	6.3	6.5	3.7	0.2	13.7
UWP-MAINCHANNEL	6	826	6.4	6.3	1.1	0.0	8.4
	7	1396	6.9	6.9	1.1	3.1	10.2
	8	1443	5.0	5.0	1.6	0.1	8.1
	9	1384	6.4	6.0	1.8	0.0	14.9
	10	505	7.2	7.4	0.7	5.8	9.6
UWP-MIDDLE	6	1013	3.6	5.2	4.8	0.0	17.5
	7	1389	0.0	1.5	2.5	-0.2	10.0
	8	1443	0.2	1.1	1.9	-0.2	9.1
	9	1391	1.8	2.5	2.1	0.1	10.5
	10	505	8.8	8.5	1.9	4.2	17.8
UWP-NEARSHORE	6	1076	2.7	3.6	3.4	0.0	12.7
	7	1433	4.6	4.6	2.9	0.0	11.2
	8	1444	0.9	1.7	2.1	-0.1	8.5
	9	1390	2.3	2.4	1.9	-0.1	8.6
	10	505	7.0	6.6	1.8	1.6	9.5
UWP2-MAINCHANNEL	6	1059	7.2	7.3	0.5	5.8	10.9
	7	1108	7.4	7.4	0.6	5.6	8.9
	8	1444	5.5	5.0	2.4	-0.1	9.2
	9	1390	6.0	4.8	2.6	-0.1	9.5
	10	504	6.8	6.9	0.6	5.9	8.4
UWP2-MIDDLE	6	781	6.7	6.9	2.7	1.8	15.1
	7	1433	3.3	3.5	2.7	-0.1	13.8
	8	1444	-0.1	0.0	0.6	-0.2	6.6
	9	1390	-0.2	0.4	1.3	-0.2	8.9
	10	505	-0.3	-0.2	0.7	-0.3	6.3
UWP2-NEARSHORE	6	1009	7.2	7.7	2.7	3.3	18.4
	7	1391	3.3	3.5	2.5	-0.2	10.5
	8	1444	0.5	1.0	1.7	-0.4	11.0
	9	1389	2.8	3.0	2.6	-0.4	16.4
	10	505	7.7	7.6	2.4	1.8	13.2

Table 3-5
Summary of R2 Dissolved Oxygen Probe Water Column Monitoring in Housatonic River -- 2001

Location	Month	Sample Number	Median	Arithmetic Mean	Standard Deviation	Minimum	Maximum
Temperature (^{o}C)							
OM8-MAINCHANNEL	6	781	21.7	21.3	1.5	17.6	23.8
	7	1401	20.4	20.6	1.8	13.0	26.1
	8	692	22.7	23.1	1.5	20.5	25.8
	9	24	14.2	14.1	0.2	13.9	14.3
	10	505	13.8	13.6	1.9	9.9	16.5
OM8-MIDDLE	6	834	23.4	23.2	1.8	18.7	27.0
	7	1397	21.9	21.9	2.1	13.2	27.5
	8	1443	23.8	24.1	1.7	20.2	28.4
	9	1391	19.5	19.6	2.2	13.7	25.0
	10	505	13.5	13.2	2.7	7.5	17.4
OM8-NEARSHORE	6	1074	23.0	22.7	3.1	14.5	29.2
	7	881	21.0	21.0	2.7	13.9	28.7
	8	750	23.9	24.1	2.3	19.3	30.1
	9	1391	19.7	19.7	2.9	13.1	27.0
	10	505	13.4	13.7	3.3	7.1	20.4
UWP-MAINCHANNEL	6	826	21.8	21.6	1.6	17.5	26.1
	7	1396	20.5	21.1	2.1	13.7	26.7
	8	1443	22.8	23.1	1.5	20.2	27.8
	9	1384	18.6	18.7	2.1	13.9	22.6
	10	505	14.0	14.0	1.9	9.8	17.8
UWP-MIDDLE	6	1013	22.2	21.8	2.0	15.7	26.0
	7	1389	20.1	20.3	1.6	13.4	25.4
	8	1443	22.6	22.9	1.9	19.6	31.0
	9	1391	18.7	18.6	2.2	13.6	23.6
	10	505	14.0	14.4	3.1	8.4	20.5
UWP-NEARSHORE	6	1076	21.4	21.3	2.2	15.6	28.6
	7	1433	21.6	21.5	2.5	13.1	29.3
	8	1444	23.7	24.2	2.3	19.5	30.3
	9	1390	19.3	19.2	2.4	13.7	24.8
	10	505	13.7	14.2	3.2	7.5	20.8
UWP2-MAINCHANNEL	6	1059	20.8	20.5	2.2	15.6	23.7
	7	1108	20.8	21.0	1.7	18.1	25.6
	8	1444	22.2	22.6	1.5	20.2	26.4
	9	1390	18.3	18.1	1.9	13.9	22.0
	10	504	13.9	13.7	1.8	10.5	16.8
UWP2-MIDDLE	6	781	22.9	22.1	2.8	15.3	26.1
	7	1433	21.0	21.2	1.9	13.1	25.3
	8	1444	21.9	21.9	1.2	19.7	24.6
	9	1390	18.6	18.3	1.6	14.0	21.6
	10	505	14.3	14.3	2.1	10.5	18.2
UWP2-NEARSHORE	6	1009	22.8	22.4	2.8	15.1	27.4
	7	1391	21.1	21.4	2.0	12.8	28.7
	8	1444	22.8	23.0	1.5	19.8	26.7
	9	1389	19.3	19.2	2.1	13.6	24.4
	10	505	13.4	13.9	3.1	7.5	19.9

Table 3-5
Summary of R2 Dissolved Oxygen Probe Water Column Monitoring in Housatonic River -- 2001

Location	Month	Sample Number	Median	Arithmetic Mean	Standard Deviation	Minimum	Maximum
pH							
OM8-MAINCHANNEL	6	781	7.7	7.8	0.1	7.5	8.5
	7	1401	7.8	7.8	0.2	6.2	8.9
	8	692	7.7	7.7	0.1	7.5	8.0
	9	24	7.6	7.6	0.0	7.5	7.6
	10	505	7.6	7.6	0.1	7.4	7.9
OM8-MIDDLE	6	834	7.3	7.4	0.2	7.0	8.4
	7	1397	7.5	7.6	0.3	5.4	8.6
	8	1443	7.5	7.5	0.3	7.1	8.8
	9	1391	7.9	7.9	0.3	7.3	8.9
	10	505	7.9	7.9	0.3	7.2	8.6
OM8-NEARSHORE	6	1074	7.5	7.6	0.4	7.1	9.3
	7	881	7.5	7.6	0.5	5.9	9.4
	8	750	8.4	8.4	0.6	7.4	9.9
	9	1391	8.2	8.3	0.6	7.2	9.7
	10	505	7.7	7.7	0.4	7.1	8.7
UWP-MAINCHANNEL	6	826	7.6	7.6	0.1	7.0	8.2
	7	1105	7.6	7.7	0.2	6.5	8.9
	8	1443	7.7	7.8	0.2	7.2	8.3
	9	1384	7.5	7.5	0.2	7.1	8.3
	10	505	7.5	7.5	0.2	7.1	8.4
UWP-MIDDLE	6	1013	7.2	7.4	0.5	7.0	9.2
	7	1389	7.1	7.2	0.2	5.7	8.5
	8	1443	7.3	7.4	0.4	6.9	9.2
	9	1391	7.4	7.5	0.4	7.0	8.8
	10	505	7.9	8.0	0.3	7.3	8.9
UWP-NEARSHORE	6	1076	7.1	7.2	0.4	6.9	10.0
	7	1433	7.4	7.5	0.4	6.8	8.8
	8	1444	7.3	7.3	0.3	6.7	8.5
	9	1390	7.4	7.5	0.2	7.2	8.5
	10	505	7.8	7.8	0.3	7.3	8.5
UWP2-MAINCHANNEL	6	1059	7.7	7.8	0.1	7.4	8.0
	7	1108	7.8	7.8	0.1	7.0	8.3
	8	1444	7.7	7.7	0.2	7.2	8.2
	9	1390	7.5	7.5	0.1	7.2	8.3
	10	504	7.7	7.7	0.1	7.5	7.9
UWP2-MIDDLE	6	781	7.8	8.0	0.5	7.2	9.2
	7	1433	7.6	7.7	0.4	6.5	9.2
	8	1444	7.2	7.2	0.2	6.9	8.5
	9	1390	7.2	7.2	0.1	7.0	7.9
	10	505	7.2	7.2	0.1	7.1	7.5
UWP2-NEARSHORE	6	1009	7.8	8.0	0.5	7.1	9.5
	7	1391	7.5	7.6	0.4	6.8	9.0
	8	1444	7.3	7.3	0.2	6.9	8.0
	9	1389	7.3	7.4	0.2	6.8	8.8
	10	505	7.7	7.8	0.4	7.2	8.9

Note:

1. Includes all data collected by R2 (6/6/2001 - 10/11/2001).

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Table 3-6
Summary of Monthly Water Column Monitoring in Housatonic River
Inorganic Constituent Analysis -- 1996-2002

Constituent/ Location	Sample Number	Frequency of Detection (%)	Median	Arithmetic Mean	+2 Standard Errors	-2 Standard Errors	Minimum	Maximum
Alkalinity (mg/L)								
Dawes/Pomeroy Avenue Bridge	15	100	136	125	150	101	25	186
Holmes Road Bridge	15	100	118	118	137	99	39.5	170
Adjacent to Joseph Drive	15	100	120	119	136	101	41	170
Pittsfield WWTP	14	100	105	101	112	89	44	124
New Lenox Road Bridge	15	100	112	108	121	96	55	138
Woods Pond Headwaters	14	100	113	110	122	98	61	140
Above Woods Pond Dam	13	100	104	107	119	96	63	134
Schweitzer/Lenoxdale Bridge	14	100	102	106	119	94	64	161
Ammonia as N (mg/L)								
Dawes/Pomeroy Avenue Bridge	15	100	0.25	0.44	0.66	0.21	0.060	1.6
Holmes Road Bridge	15	100	0.17	0.24	0.33	0.14	0.040	0.78
Adjacent to Joseph Drive	15	100	0.11	0.21	0.30	0.11	0.060	0.75
Pittsfield WWTP	14	100	0.14	0.37	0.78	< 0	0.070	3.0
New Lenox Road Bridge	15	100	0.11	0.16	0.21	0.10	0.050	0.37
Woods Pond Headwaters	14	100	0.12	0.27	0.53	0.015	0.060	1.9
Above Woods Pond Dam	13	92	0.10	0.13	0.18	0.088	ND	0.32
Schweitzer/Lenoxdale Bridge	14	93	0.11	0.13	0.17	0.092	ND	0.30
5-Day Biological Oxygen Demand (mg/L)								
Dawes/Pomeroy Avenue Bridge	15	47	1.5	1.7	2.2	1.3	ND	3.0
Holmes Road Bridge	16	38	1.0	1.6	2.0	1.1	ND	3.5
Adjacent to Joseph Drive	16	38	1.0	1.6	1.9	1.2	ND	2.9
Pittsfield WWTP	15	53	2.1	1.9	2.3	1.4	ND	3.8
New Lenox Road Bridge	16	31	1.0	1.6	2.0	1.2	ND	3.7
Woods Pond Headwaters	15	27	1.0	1.4	1.8	1.1	ND	3.0
Above Woods Pond Dam	14	43	1.3	1.8	2.3	1.3	ND	3.8
Schweitzer/Lenoxdale Bridge	15	47	1.5	2.0	2.7	1.4	ND	4.1

Table 3-6
Summary of Monthly Water Column Monitoring in Housatonic River
Inorganic Constituent Analysis -- 1996-2002

Constituent/ Location	Sample Number	Frequency of Detection (%)	Median	Arithmetic Mean	+2 Standard Errors	-2 Standard Errors	Minimum	Maximum
Cyanide (µg/L)								
Dawes/Pomeroy Avenue Bridge	14	0	NA	ND	NA	NA	ND	NA
Holmes Road Bridge	15	0	NA	ND	NA	NA	ND	NA
Adjacent to Joseph Drive	15	0	NA	ND	NA	NA	ND	NA
Pittsfield WWTP	13	0	NA	ND	NA	NA	ND	NA
New Lenox Road Bridge	15	0	NA	ND	NA	NA	ND	NA
Woods Pond Headwaters	14	0	NA	ND	NA	NA	ND	NA
Above Woods Pond Dam	12	0	NA	ND	NA	NA	ND	NA
Schweitzer/Lenoxdale Bridge	13	0	NA	ND	NA	NA	ND	NA
Hardness (mg/L)								
Dawes/Pomeroy Avenue Bridge	15	100	150	133	158	109	34	186
Holmes Road Bridge	15	100	130	129	148	110	51	176
Adjacent to Joseph Drive	15	100	132	130	149	112	50	182
Pittsfield WWTP	14	100	129	125	140	109	56	166
New Lenox Road Bridge	15	100	132	128	143	114	66	162
Woods Pond Headwaters	14	100	132	127	141	113	71	156
Above Woods Pond Dam	13	100	126	121	133	110	76	150
Schweitzer/Lenoxdale Bridge	14	100	133	134	151	117	94	226
Hardness, Dissolved (mg/L)								
Dawes/Pomeroy Avenue Bridge	1	100	NA	70	NA	NA	NA	NA
Holmes Road Bridge	1	100	NA	90	NA	NA	NA	NA
Nitrate and Nitrite as N (mg/L)								
Dawes/Pomeroy Avenue Bridge	15	100	0.53	0.95	1.6	0.31	0.11	5.0
Holmes Road Bridge	15	100	0.43	0.55	0.76	0.34	0.11	1.7
Adjacent to Joseph Drive	15	100	0.58	0.64	0.85	0.42	0.020	1.7
Pittsfield WWTP	14	100	2.0	2.8	3.8	1.7	0.10	6.4
New Lenox Road Bridge	15	93	2.1	2.3	3.0	1.6	ND	5.1
Woods Pond Headwaters	14	93	1.7	1.9	2.5	1.4	ND	3.6
Above Woods Pond Dam	13	100	1.8	2.1	2.9	1.3	0.36	6.3
Schweitzer/Lenoxdale Bridge	14	100	1.8	2.0	2.6	1.4	0.39	4.6

Table 3-6
Summary of Monthly Water Column Monitoring in Housatonic River
Inorganic Constituent Analysis -- 1996-2002

Constituent/ Location	Sample Number	Frequency of Detection (%)	Median	Arithmetic Mean	+2 Standard Errors	-2 Standard Errors	Minimum	Maximum
Nitrite as N (mg/L)								
Dawes/Pomeroy Avenue Bridge	15	73	0.016	0.034	0.063	0.0060	ND	0.22
Holmes Road Bridge	15	60	0.0080	0.019	0.036	0.0025	ND	0.13
Adjacent to Joseph Drive	15	67	0.0090	0.015	0.027	0.0033	ND	0.089
Pittsfield WWTP	14	79	0.0075	0.012	0.020	0.0035	ND	0.064
New Lenox Road Bridge	15	87	0.010	0.016	0.028	0.0041	ND	0.098
Woods Pond Headwaters	14	71	0.015	0.017	0.025	0.0089	ND	0.057
Above Woods Pond Dam	13	85	0.010	0.024	0.038	0.011	ND	0.081
Schweitzer/Lenoxdale Bridge	14	93	0.013	0.023	0.035	0.011	ND	0.082
Orthophosphate as P (mg/L)								
Dawes/Pomeroy Avenue Bridge	15	13	0.0050	0.0063	0.0084	0.0043	ND	0.020
Holmes Road Bridge	15	27	0.0050	0.020	0.036	0.0038	ND	0.090
Adjacent to Joseph Drive	15	20	0.0050	0.0093	0.015	0.0032	ND	0.050
Pittsfield WWTP	14	100	0.15	0.14	0.19	0.088	0.010	0.32
New Lenox Road Bridge	15	100	0.090	0.091	0.11	0.071	0.020	0.15
Woods Pond Headwaters	14	100	0.070	0.077	0.099	0.055	0.010	0.16
Above Woods Pond Dam	13	100	0.060	0.10	0.17	0.040	0.020	0.44
Schweitzer/Lenoxdale Bridge	14	100	0.085	0.10	0.14	0.058	0.030	0.36
Total Phosphate as P (mg/L)								
Dawes/Pomeroy Avenue Bridge	15	93	0.030	0.034	0.047	0.021	ND	0.10
Holmes Road Bridge	15	93	0.020	0.029	0.041	0.017	ND	0.090
Adjacent to Joseph Drive	15	87	0.020	0.052	0.099	0.0054	ND	0.31
Pittsfield WWTP	14	100	0.19	0.18	0.24	0.12	0.020	0.39
New Lenox Road Bridge	15	100	0.12	0.14	0.16	0.11	0.050	0.27
Woods Pond Headwaters	14	100	0.11	0.11	0.13	0.089	0.050	0.20
Above Woods Pond Dam	13	100	0.080	0.11	0.15	0.074	0.040	0.30
Schweitzer/Lenoxdale Bridge	14	100	0.11	0.12	0.14	0.094	0.050	0.21

Table 3-6
Summary of Monthly Water Column Monitoring in Housatonic River
Inorganic Constituent Analysis -- 1996-2002

Constituent/ Location	Sample Number	Frequency of Detection (%)	Median	Arithmetic Mean	+2 Standard Errors	-2 Standard Errors	Minimum	Maximum
Sulfide (mg/L)								
Dawes/Pomeroy Avenue Bridge	13	38	0.40	0.45	0.53	0.37	ND	0.80
Holmes Road Bridge	13	31	0.40	0.44	0.53	0.35	ND	0.80
Adjacent to Joseph Drive	13	23	0.40	0.41	0.49	0.32	ND	0.80
Pittsfield WWTP	12	17	0.40	0.40	0.49	0.31	ND	0.80
New Lenox Road Bridge	13	31	0.40	0.44	0.53	0.35	ND	0.80
Woods Pond Headwaters	12	17	0.40	0.40	0.46	0.33	ND	0.60
Above Woods Pond Dam	11	9	0.40	0.38	0.43	0.32	ND	0.50
Schweitzer/Lenoxdale Bridge	12	8	0.40	0.38	0.44	0.31	ND	0.60
TKN (mg/L)								
Dawes/Pomeroy Avenue Bridge	15	100	0.99	1.0	1.3	0.82	0.37	2.0
Holmes Road Bridge	15	100	0.72	0.68	0.77	0.58	0.24	1.1
Adjacent to Joseph Drive	15	93	0.67	0.64	0.74	0.53	ND	1.0
Pittsfield WWTP	14	100	0.78	0.83	1.0	0.64	0.24	1.9
New Lenox Road Bridge	15	100	0.76	0.87	1.2	0.58	0.39	2.8
Woods Pond Headwaters	14	86	0.69	0.62	0.75	0.49	ND	0.95
Above Woods Pond Dam	13	92	0.77	0.69	0.86	0.53	ND	1.1
Schweitzer/Lenoxdale Bridge	14	100	0.82	0.74	0.84	0.64	0.44	0.96
Total Dissolved Solids (mg/L)								
Dawes/Pomeroy Avenue Bridge	15	100	262	244	287	200	64	390
Holmes Road Bridge	15	100	207	239	292	186	88	813
Adjacent to Joseph Drive	15	100	197	203	235	171	87	305
Pittsfield WWTP	14	100	207	213	245	181	104	300
New Lenox Road Bridge	15	100	212	214	243	185	102	292
Woods Pond Headwaters	14	100	201	208	240	177	125	307
Above Woods Pond Dam	13	100	198	200	226	175	128	267
Schweitzer/Lenoxdale Bridge	14	100	201	206	227	184	145	260

Table 3-6
Summary of Monthly Water Column Monitoring in Housatonic River
Inorganic Constituent Analysis -- 1996-2002

Constituent/ Location	Sample Number	Frequency of Detection (%)	Median	Arithmetic Mean	+2 Standard Errors	-2 Standard Errors	Minimum	Maximum
Total Suspended Solids (mg/L)								
Dawes/Pomeroy Avenue Bridge	94	98	3.5	7.0	9.3	4.7	ND	74
Holmes Road Bridge	94	98	3.7	8.3	11	5.4	ND	82
Adjacent to Joseph Drive	36	100	4.2	11	18	3.2	1.0	127
Pittsfield WWTP	17	100	4.4	16	35	< 0	1.3	169
New Lenox Road Bridge	94	99	4.0	7.1	9.9	4.4	ND	111
Woods Pond Headwaters	89	100	3.8	5.1	6.1	4.1	1.0	26
Above Woods Pond Dam	34	100	4.0	4.1	4.8	3.4	1.3	13
Schweitzer/Lenoxdale Bridge	93	96	2.9	3.6	4.2	3.0	ND	22
Division Street Bridge	78	96	3.9	4.7	5.5	3.9	ND	24

Notes:

1. Includes all data collected by GE (1996-2002) and EPA (1998-1999).
2. Non-detected values were assigned a value of one-half the detection limit prior to calculation.
3. Duplicate samples were averaged.
4. ND = Not Detected.
5. NA = Analysis not conducted due to sample size (n<3) and/or frequency of detection (0%).

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Table 3-7
Summary of Monthly Water Column Monitoring in Housatonic River
Organic Constituent Analysis -- 1996-2002

Constituent/ Location	Sample Number	Frequency of Detection (%)	Median	Arithmetic Mean	+2 Standard Errors	-2 Standard Errors	Minimum	Maximum
Chlorophyll *a* (µg/L)								
Dawes/Pomeroy Avenue Bridge	82	100	1.2	1.7	2.1	1.3	0.30	15
Holmes Road Bridge	82	100	1.6	2.0	2.4	1.6	0.40	13
Adjacent to Joseph Drive	27	100	1.8	1.9	2.2	1.5	0.70	3.9
Pittsfield WWTP	14	100	1.4	1.7	2.1	1.2	0.70	3.8
New Lenox Road Bridge	82	100	1.6	1.7	1.9	1.5	0.50	4.1
Woods Pond Headwaters	78	100	1.5	2.0	2.4	1.7	0.50	9.7
Above Woods Pond Dam	26	100	4.6	6.6	9.4	3.9	0.60	29
Schweitzer/Lenoxdale Bridge	82	100	2.3	4.1	5.2	3.1	0.50	20
Division Street Bridge	66	100	2.4	5.6	8.2	3.1	0.60	66
Particulate Organic Carbon (mg/L)								
Dawes/Pomeroy Avenue Bridge	70	93	0.28	0.59	0.87	0.32	ND	7.7
Holmes Road Bridge	70	96	0.27	0.62	0.90	0.34	ND	6.5
Adjacent to Joseph Drive	12	92	0.34	0.67	1.3	0.036	ND	4.1
New Lenox Road Bridge	70	94	0.29	0.48	0.66	0.31	ND	4.4
Woods Pond Headwaters	67	94	0.28	0.41	0.53	0.28	ND	3.8
Above Woods Pond Dam	12	75	0.38	0.41	0.61	0.21	ND	1.3
Schweitzer/Lenoxdale Bridge	70	91	0.24	0.39	0.60	0.19	ND	7.4
Division Street Bridge	69	93	0.28	0.39	0.48	0.30	ND	2.5

Table 3-7
Summary of Monthly Water Column Monitoring in Housatonic River
Organic Constituent Analysis -- 1996-2002

Constituent/ Location	Sample Number	Frequency of Detection (%)	Median	Arithmetic Mean	+2 Standard Errors	-2 Standard Errors	Minimum	Maximum
Total Organic Carbon (mg/L)								
Dawes/Pomeroy Avenue Bridge	8	100	5.6	5.9	7.1	4.8	4.0	9.2
Holmes Road Bridge	8	100	4.7	4.5	5.3	3.7	2.9	6.9
Adjacent to Joseph Drive	8	100	4.8	4.3	5.2	3.5	2.7	6.2
Pittsfield WWTP	8	100	4.8	4.7	5.5	3.9	2.8	6.0
New Lenox Road Bridge	8	100	4.7	4.9	6.0	3.7	3.0	7.4
Woods Pond Headwaters	8	100	4.3	4.4	5.1	3.7	3.4	6.5
Above Woods Pond Dam	8	100	4.4	4.6	5.5	3.8	3.2	6.5
Schweitzer/Lenoxdale Bridge	8	100	4.0	4.2	4.9	3.6	3.1	6.0
Dissolved Organic Carbon (mg/L)								
Dawes/Pomeroy Avenue Bridge	14	100	6.4	7.0	8.2	5.7	4.8	12
Holmes Road Bridge	15	100	5.6	5.8	6.8	4.7	2.9	9.8
Adjacent to Joseph Drive	15	100	4.9	6.0	7.6	4.4	2.7	13
Pittsfield WWTP	14	100	5.1	6.9	9.6	4.2	2.8	22
New Lenox Road Bridge	15	100	4.9	7.4	9.9	4.9	2.7	20
Woods Pond Headwaters	14	100	5.5	5.9	7.5	4.4	2.9	15
Above Woods Pond Dam	14	100	5.8	7.5	10	4.7	3.7	22
Schweitzer/Lenoxdale Bridge	14	100	4.9	6.2	8.0	4.4	3.1	14

Notes:

1. Includes all data collected by GE (1996-2002) and EPA (1998-1999).
2. Non-detected values were assigned a value of one-half the detection limit prior to calculation.
3. Duplicate samples were averaged.
4. ND = Not Detected.

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Table 3-8
Summary of TSS Concentration by Year (mg/L) -- 1996-2002

Sampling Location/ Year	Sample Number	Frequency of Detection (%)	Median	Arithmetic Mean	+2 Standard Errors	-2 Standard Errors	Minimum	Maximum
Dawes/Pomeroy Avenue Bridge								
1996	7	100	4.4	6.3	11	2.1	2.3	18
1997	12	100	4.3	8.2	16	0.8	2.4	48
1998	26	100	3.3	5.9	11	1.2	1.3	74
1999	17	100	4.4	12	19	4.3	1.5	47
2000	12	83	2.1	2.7	3.8	1.5	ND	7.9
2001	12	100	3.2	6.1	12	0.5	1.0	36
2002	8	100	4.3	7.2	12	2.4	1.8	21
Holmes Road Bridge								
1996	7	100	5.7	7.1	11	2.9	1.6	19
1997	12	100	4.4	8.9	16	1.7	2.9	47
1998	26	100	2.9	7.9	14	1.4	0.8	82
1999	17	100	3.9	9.0	15	2.9	1.2	49
2000	12	83	2.7	5.4	11	0.2	ND	34
2001	12	100	3.1	7.8	17	< 0	1.5	56
2002	8	100	4.3	13	26	0.1	1.8	51
New Lenox Road Bridge								
1996	7	100	5.5	6.2	8.4	4.0	3.1	11
1997	12	100	6.4	12	21	2.3	3.6	60
1998	26	100	3.8	5.8	9.1	2.5	1.4	46
1999	17	100	3.8	12	25	< 0	1.5	111
2000	12	92	2.9	4.6	6.9	2.2	ND	14
2001	12	100	3.0	3.5	4.9	2.2	1.0	8.0
2002	8	100	3.5	4.1	5.3	2.8	2.8	8.3

Table 3-8
Summary of TSS Concentration by Year (mg/L) -- 1996-2002

Sampling Location/ Year	Sample Number	Frequency of Detection (%)	Median	Arithmetic Mean	+2 Standard Errors	-2 Standard Errors	Minimum	Maximum
Woods Pond Headwaters								
1996	7	100	6.4	7.2	9.1	5.3	4.5	10
1997	11	100	6.0	7.9	12	3.6	2.3	26
1998	26	100	3.9	3.9	4.6	3.2	1.2	8.9
1999	15	100	3.6	6.1	9.4	2.8	1.0	26
2000	12	100	3.1	5.2	9.0	1.4	1.2	25
2001	10	100	3.5	3.5	4.2	2.8	1.7	5.1
2002	8	100	3.1	3.1	3.8	2.5	1.9	4.3
Schweitzer/Lenoxdale Bridge								
1996	7	100	3.8	4.5	6.1	2.9	2.3	8.2
1997	12	100	4.2	4.1	5.2	3.0	1.9	8.0
1998	25	96	3.5	3.5	4.2	2.9	ND	6.6
1999	17	94	2.8	3.6	4.8	2.4	ND	9.5
2000	12	83	2.4	3.3	5.5	1.1	ND	15
2001	12	100	2.1	3.9	7.2	0.6	1.4	22
2002	8	100	2.8	2.5	3.1	1.9	1.2	3.6
Division Street Bridge								
1996	7	100	5.9	7.4	10	4.5	3.8	14
1997	12	100	5.3	5.4	6.9	4.0	2.3	9.7
1998	20	95	4.2	4.5	5.8	3.3	ND	11
1999	7	100	3.1	3.6	5.3	1.8	1.3	8.2
2000	12	100	2.8	5.3	9.1	1.5	1.2	24
2001	12	92	2.3	3.2	4.6	1.8	ND	8.0
2002	8	88	4.0	3.8	5.2	2.3	ND	6.4

Notes:

1. Includes all data collected by GE (1996-2002) and EPA (1998-1999).
2. Non-detected values were assigned a value of one-half the detection limit prior to calculation.
3. Duplicate samples were averaged.
4. ND = Not Detected.

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Table 3-9
Summary of PCB Data from the Housatonic River (µg/L) -- 1996-2002

Sampling Location	Years Sampled	Sample Number	Frequency of Detection (%)	Median	Arithmetic Mean	+2 Standard Errors	-2 Standard Errors	Minimum	Maximum
Total PCB									
Dawes/Pomeroy Avenue Bridge	1996-2002	94	53	0.027	0.067	0.089	0.045	ND	0.62
Holmes Road Bridge	1996-2002	94	56	0.026	0.077	0.11	0.048	ND	0.95
Adjacent to Joseph Drive	1996-1999	36	89	0.078	0.12	0.17	0.070	ND	0.72
Pittsfield WWTP	1996-1999	17	82	0.054	0.066	0.09	0.040	ND	0.19
New Lenox Road Bridge	1996-2002	94	80	0.075	0.10	0.13	0.077	ND	0.63
Woods Pond Headwaters	1996-2002	89	89	0.084	0.10	0.12	0.079	ND	0.60
Above Woods Pond Dam	1996-1999	34	88	0.073	0.083	0.11	0.058	ND	0.39
Schweitzer/Lenoxdale Bridge	1996-2002	93	74	0.062	0.066	0.079	0.054	ND	0.35
Division Street Bridge[1]	1996-2002	78	36	0.015	0.033	0.040	0.026	ND	0.18
Dissolved PCB									
Dawes/Pomeroy Avenue Bridge	1996-1999	19	11	0.0070	0.0086	0.010	0.0073	ND	0.016
Holmes Road Bridge	1996-1999	20	15	0.0070	0.023	0.043	0.0033	ND	0.17
Adjacent to Joseph Drive	1996-1999	20	10	0.0070	0.031	0.062	< 0	ND	0.26
Pittsfield WWTP	1996-1999	15	13	0.0070	0.023	0.052	< 0	ND	0.23
New Lenox Road Bridge	1996-1999	20	20	0.0070	0.038	0.073	0.0030	ND	0.32
Woods Pond Headwaters	1996-1999	19	16	0.0070	0.019	0.033	0.0048	ND	0.13
Above Woods Pond Dam	1996-1999	18	17	0.0070	0.019	0.033	0.0036	ND	0.13
Schweitzer/Lenoxdale Bridge	1996-1999	19	16	0.0070	0.010	0.013	0.0073	ND	0.028
Division Street Bridge	1996	5	40	0.011	0.018	0.027	0.0093	ND	0.031

Notes:

1. Includes all data collected by GE (1996-2002) and EPA (1998-1999) (sample BBLID 1543 excluded due to an anomalously high detection of 21 ng/L).
2. Non-detected values were assigned a value of one-half the detection limit prior to calculation.
3. Duplicate samples were averaged.
4. ND = Not Detected.
5. Data results from sampling collected prior to 1989 and LMS sampling in 1991-1993 are not included due to inconsistent sampling methods.

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Table 3-10
Summary of PCB Concentration by Year (μg/L) -- 1996-2002

Sampling Location/ Year	Sample Number	Frequency of Detection (%)	Median	Arithmetic Mean	+2 Standard Errors	-2 Standard Errors	Minimum	Maximum
Total PCB Concentration								
Dawes/Pomeroy Avenue Bridge								
1996	7	57	0.024	0.030	0.046	0.015	ND	0.057
1997	12	50	0.018	0.067	0.13	0.0076	ND	0.35
1998	26	54	0.063	0.047	0.056	0.038	ND	0.14
1999	17	65	0.018	0.089	0.15	0.022	ND	0.55
2000	12	33	0.013	0.026	0.040	0.013	ND	0.077
2001	12	42	0.013	0.099	0.21	< 0	ND	0.62
2002	8	75	0.11	0.13	0.22	0.041	ND	0.40
Holmes Road Bridge								
1996	7	86	0.094	0.11	0.19	0.035	ND	0.28
1997	12	75	0.043	0.13	0.28	< 0	ND	0.95
1998	26	58	0.045	0.072	0.12	0.024	ND	0.61
1999	17	71	0.031	0.061	0.090	0.031	ND	0.20
2000	12	25	0.013	0.040	0.087	< 0	ND	0.30
2001	12	42	0.013	0.067	0.16	< 0	ND	0.60
2002	8	38	0.013	0.089	0.20	< 0	ND	0.49
Adjacent to Joseph Drive								
1996	7	86	0.065	0.079	0.13	0.030	ND	0.39
1997	12	100	0.091	0.19	0.31	0.068	0.027	0.72
1998	8	88	0.043	0.047	0.068	0.025	ND	0.096
1999	9	78	0.091	0.13	0.23	0.025	ND	0.50

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RFI Report

Table 3-10
Summary of PCB Concentration by Year (μg/L) -- 1996-2002

Sampling Location/ Year	Sample Number	Frequency of Detection (%)	Median	Arithmetic Mean	+2 Standard Errors	-2 Standard Errors	Minimum	Maximum
Pittsfield WWTP								
1996	3	67	0.049	0.044	0.080	0.0082	ND	0.073
1998	5	80	0.034	0.036	0.053	0.018	ND	0.057
1999	9	89	0.098	0.089	0.13	0.048	ND	0.19
New Lenox Road Bridge								
1996	7	100	0.17	0.28	0.46	0.098	0.025	0.63
1997	12	83	0.079	0.11	0.18	0.049	ND	0.42
1998	26	85	0.066	0.079	0.10	0.057	ND	0.28
1999	17	88	0.089	0.12	0.19	0.055	ND	0.63
2000	12	50	0.019	0.055	0.089	0.021	ND	0.18
2001	12	75	0.043	0.063	0.097	0.029	ND	0.20
2002	8	75	0.083	0.079	0.12	0.038	ND	0.18
Woods Pond Headwaters								
1996	7	100	0.13	0.26	0.44	0.084	0.051	0.60
1997	11	100	0.094	0.10	0.13	0.078	0.025	0.15
1998	26	92	0.093	0.094	0.12	0.073	ND	0.29
1999	15	80	0.068	0.10	0.16	0.040	ND	0.48
2000	12	83	0.050	0.069	0.098	0.039	ND	0.17
2001	10	80	0.082	0.074	0.098	0.050	ND	0.12
2002	8	88	0.054	0.057	0.082	0.032	ND	0.12

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Table 3-10
Summary of PCB Concentration by Year (μg/L) -- 1996-2002

Sampling Location/ Year	Sample Number	Frequency of Detection (%)	Median	Arithmetic Mean	+2 Standard Errors	-2 Standard Errors	Minimum	Maximum
Above Woods Pond Dam								
1996	7	100	0.16	0.16	0.25	0.073	0.036	0.39
1997	12	92	0.063	0.064	0.084	0.043	ND	0.14
1998	7	71	0.054	0.052	0.080	0.024	ND	0.11
1999	8	88	0.079	0.071	0.10	0.039	ND	0.14
Schweitzer/Lenoxdale Bridge								
1996	7	100	0.071	0.081	0.12	0.047	0.030	0.15
1997	12	75	0.059	0.049	0.066	0.031	ND	0.088
1998	25	88	0.081	0.091	0.12	0.066	ND	0.35
1999	17	59	0.018	0.069	0.11	0.030	ND	0.25
2000	12	67	0.044	0.053	0.077	0.029	ND	0.14
2001	12	67	0.031	0.055	0.085	0.024	ND	0.19
2002	8	63	0.029	0.035	0.057	0.012	ND	0.11
Division Street Bridge[1]								
1996	7	86	0.048	0.064	0.11	0.022	ND	0.18
1997	12	42	0.011	0.019	0.026	0.013	ND	0.045
1998	20	50	0.063	0.057	0.067	0.047	ND	0.10
1999	7	29	0.013	0.029	0.055	0.0033	ND	0.11
2000	12	25	0.013	0.022	0.032	0.012	ND	0.063
2001	12	8	0.013	0.015	0.019	0.010	ND	0.037
2002	8	13	0.013	0.014	0.017	0.011	ND	0.025

Table 3-10
Summary of PCB Concentration by Year (μg/L) -- 1996-2002

Sampling Location/ Year	Sample Number	Frequency of Detection (%)	Median	Arithmetic Mean	+2 Standard Errors	-2 Standard Errors	Minimum	Maximum
Dissolved PCB Concentration								
Dawes/Pomeroy Avenue Bridge								
1996	5	0	NA	ND	NA	NA	ND	NA
1998	5	40	0.0070	0.0097	0.014	0.0057	ND	0.016
1999	9	0	NA	ND	NA	NA	ND	NA
Holmes Road Bridge								
1996	5	60	0.028	0.071	0.14	0.0037	ND	0.17
1998	6	0	NA	ND	NA	NA	ND	NA
1999	9	0	NA	ND	NA	NA	ND	NA
Adjacent to Joseph Drive								
1996	5	0	NA	ND	NA	NA	ND	NA
1998	6	33	0.0070	0.083	0.18	< 0	ND	0.26
1999	9	0	NA	ND	NA	NA	ND	NA
Pittsfield WWTP								
1996	1	0	NA	ND	NA	NA	NA	NA
1998	5	20	0.0070	0.0085	0.012	0.0052	ND	0.015
1999	9	11	0.0070	0.032	0.081	< 0	ND	0.23
New Lenox Road Bridge								
1996	5	60	0.055	0.068	0.13	0.0082	ND	0.17
1998	6	17	0.0065	0.059	0.16	< 0	ND	0.32
1999	9	0	NA	ND	NA	NA	ND	NA

Table 3-10
Summary of PCB Concentration by Year (μg/L) -- 1996-2002

Sampling Location/ Year	Sample Number	Frequency of Detection (%)	Median	Arithmetic Mean	+2 Standard Errors	-2 Standard Errors	Minimum	Maximum
Woods Pond Headwaters								
1996	5	60	0.050	0.053	0.095	0.0099	ND	0.13
1998	6	0	NA	ND	NA	NA	ND	NA
1999	8	0	NA	ND	NA	NA	ND	NA
Above Woods Pond Dam								
1996	5	60	0.029	0.049	0.095	0.0029	ND	0.13
1998	6	0	NA	ND	NA	NA	ND	NA
1999	7	0	NA	ND	NA	NA	ND	NA
Schweitzer/Lenoxdale Bridge								
1996	5	40	0.011	0.017	0.024	0.0095	ND	0.028
1998	5	20	0.0070	0.0089	0.013	0.0048	ND	0.017
1999	9	0	NA	ND	NA	NA	ND	NA
Division Street Bridge								
1996	5	40	0.011	0.018	0.027	0.0093	ND	0.031

Notes:

1. Includes all data collected by GE (1996-2002) and EPA (1998-1999) (sample BBLID 1543 excluded due to an anomalously high detection of 21 ng/L).
2. Non-detected values were assigned a value of one-half the detection limit prior to calculation.
3. Duplicate samples were averaged.
4. ND = Not Detected.
5. NA = Analysis not conducted due to sample size (n<3) and/or frequency of detection (0%).
6. Data results from sampling collected prior to 1989 and LMS sampling in 1991-1993 are not included due to inconsistent sampling methods.

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Table 3-11
Summary of Surface Water Total PCB Data (µg/L) -- 1989-1991 and 1996-2002

Sampling Location	Year	Sample Number	Frequency of Detection (%)	Median	Arithmetic Mean	+2 Standard Errors	-2 Standard Errors	Minimum	Maximum
Dawes/Pomeroy Avenue Bridge	1989-1991	17	35	0.033	0.064	0.11	0.022	ND	0.39
	1996-2002	94	53	0.027	0.067	0.089	0.045	ND	0.62
New Lenox Road Bridge	1989-1991	19	89	0.12	0.20	0.31	0.084	ND	1.1
	1996-2002	94	80	0.075	0.10	0.13	0.077	ND	0.63
Woods Pond Headwaters	1989-1991	17	94	0.14	0.16	0.20	0.12	ND	0.29
	1996-2002	89	89	0.084	0.10	0.12	0.079	ND	0.60
Above Woods Pond Dam	1989-1992	20	95	0.13	0.22	0.31	0.13	ND	0.89
	1996-1999	34	88	0.073	0.083	0.11	0.058	ND	0.39
Schweitzer/Lenoxdale Bridge	1989-1991	20	75	0.14	0.17	0.23	0.11	ND	0.50
	1996-2002	93	74	0.062	0.066	0.079	0.054	ND	0.35
Division Street Bridge[1]	1989-1991	19	63	0.080	0.11	0.16	0.052	ND	0.45
	1996-2002	78	36	0.015	0.033	0.040	0.026	ND	0.18

Notes:

1. Includes all data collected by GE (1989-2002) and EPA (1998-1999) (sample BBLID 1543 excluded due to an anomalously high detection of 21 ng/L).
2. Non-detected values were assigned a value of one-half the detection limit prior to calculation.
3. Duplicate samples were averaged.
4. ND = Not Detected.
5. Data results from sampling collected prior to 1989 and LMS sampling in 1991-1993 are not included due to inconsistent sampling methods.

Section 3 Figures

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engineers & scientists

HANCOCK

PITTSFIELD

DALTON

New York

Massachusetts

RICHMOND

LENOX

STOCKBRIDGE

LEE

TYRINGHAM

GREAT BARRINGTON

RIDGE

Dawes/Pomeroy Avenue Bridge

Above West Branch Confluence

Confluence

Holmes Road Bridge

Adjacent to Joseph Drive

Housatonic River

Pittsfield WWTP

New Lenox Road Bridge

Roaring Brook

Woods Pond Headwaters

Above Woods Pond Dam

Woods Pond

Woods Pond Dam

Schweitzer/Lenoxdale Bridge

Lenoxdale

Columbia Mill Dam

Lee

Glendale Dam

Glendale

Housatonic River

South Lee

Willow Mill Dam

Hop Brook

Housatonic River

Housatonic

Rising Pond Headwaters

Rising Pond

Williams River

Rising Pond Dam

Risingdale

Division Street Bridge

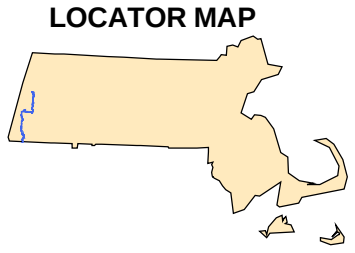
N

W

E

S

LOCATOR MAP



SCALE

0 0.25 0.5 1 1.5 Miles

LEGEND

- Sample Station Locations
- Dams
- 1 ppm Isopleth
- 100 Year Floodplain
- Railroad
- County Borders
- Town Borders
- Housatonic River

Notes:

1) The 1 ppm PCB isopleth is approximate, and was derived using hydraulic modeling performed by Blasland, Bouck, and Lee, Inc (1995/1996), available topographic mapping, available floodplain soil PCB data, and best professional judgement.
2) Hydrology and transportation coverages provided by MassGis.com
3) 100 Year Flood Plain coverage provided by FEMA (Q3 Flood data)

Figure 3 - 1
Rest of River Surface Water Sampling Locations

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QEA Quantitative Environmental Analysis, LLC

Q:\HousatonicRiver\APRs\SamplePoints.mxd

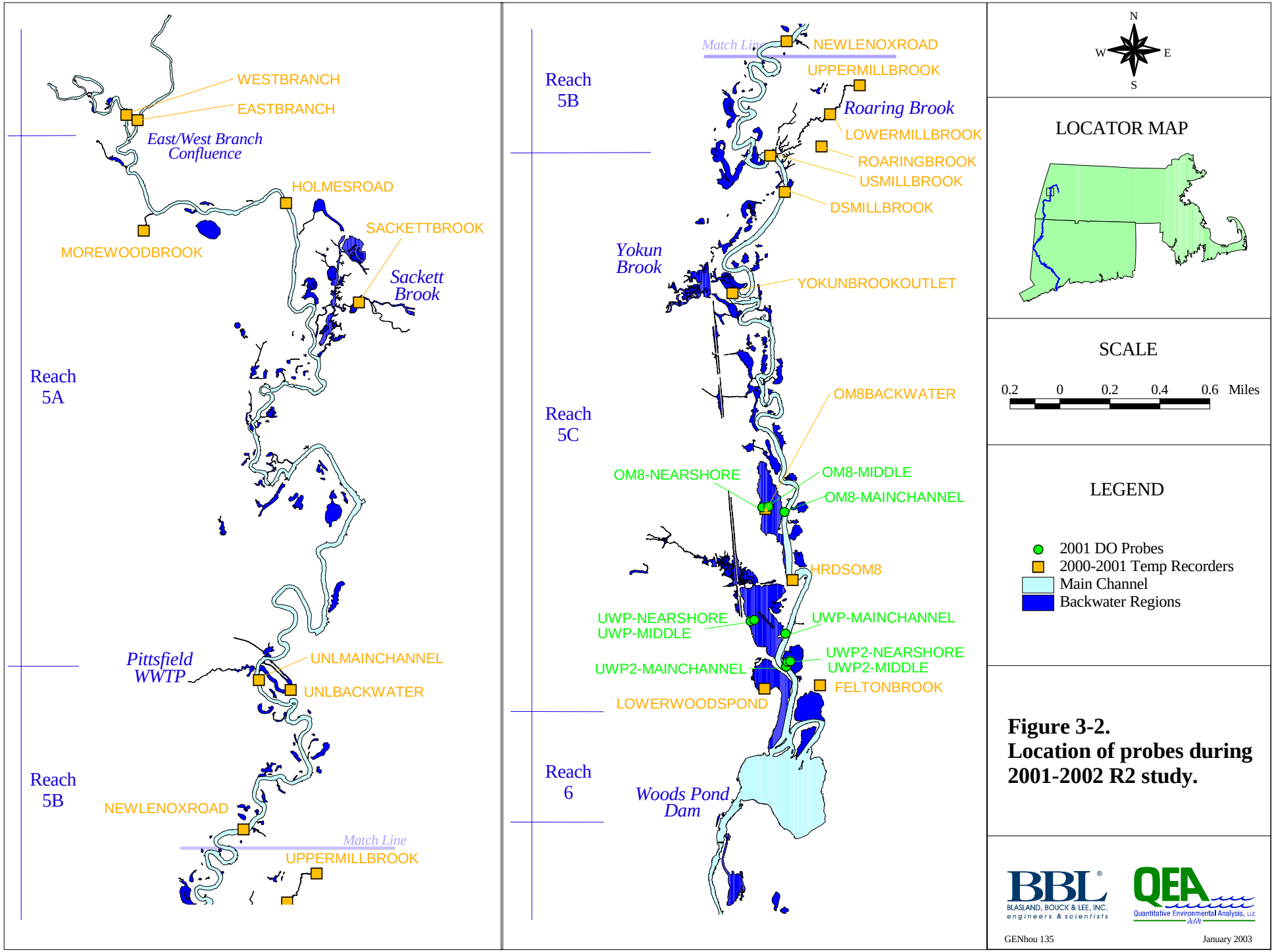

Figure 3-2.
Location of probes during 2001-2002 R2 study.

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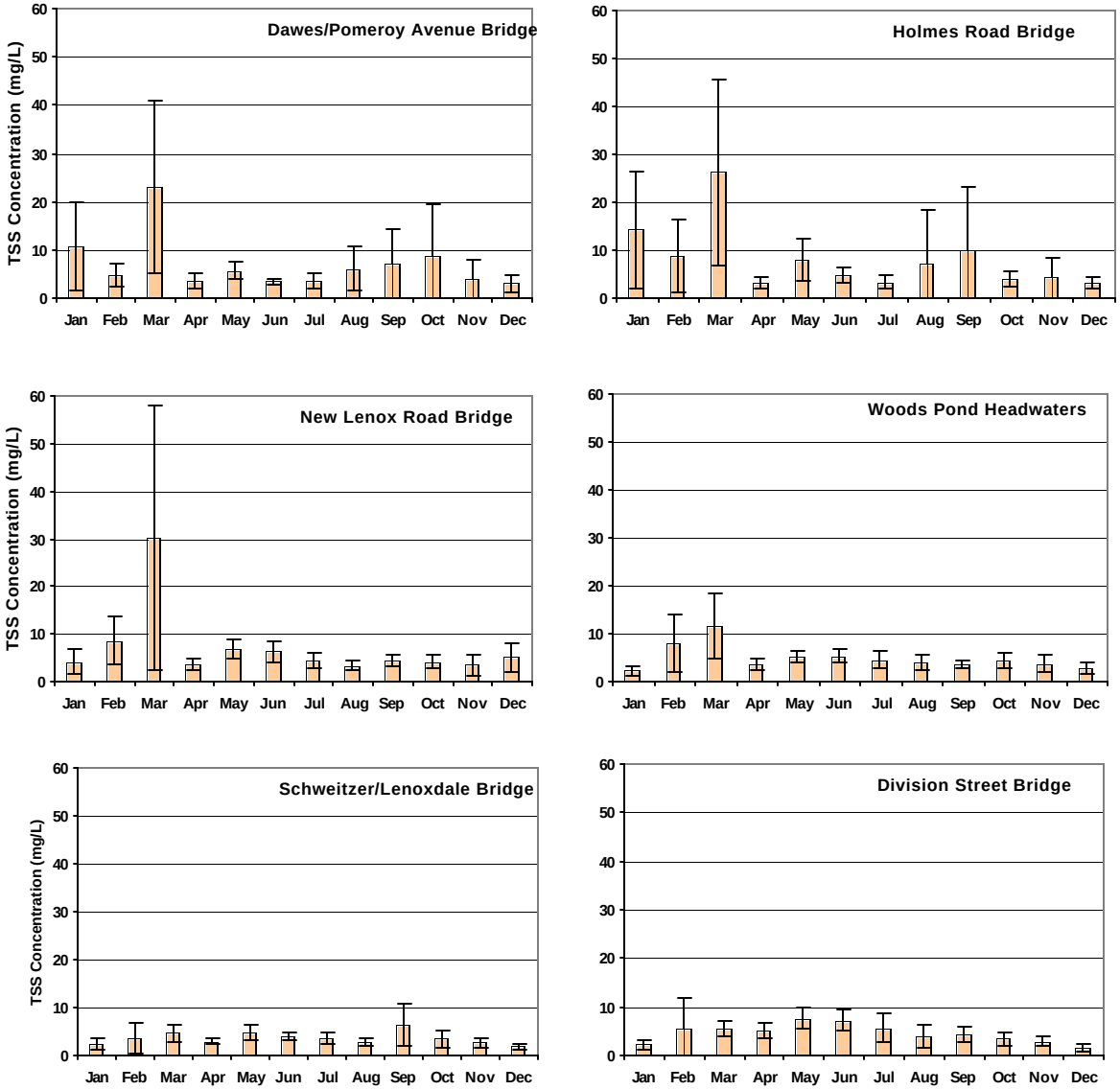
QEA Quantitative Environmental Analysis, LLC

\\kevin\d_drive\GENhou\documents\reports\RFI_report\Section3\figures\Fig3_2_R2_Probes.apr



Notes:

1. TSS = total suspended solids.
2. mg/L = milligrams per liter.
3. Presents the arithmetic mean TSS concentration and 2 standard errors by month for GE and EPA sampling conducted between 1996-2002.

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TOTAL SUSPENDED SOLIDS CONCENTRATION BY MONTH

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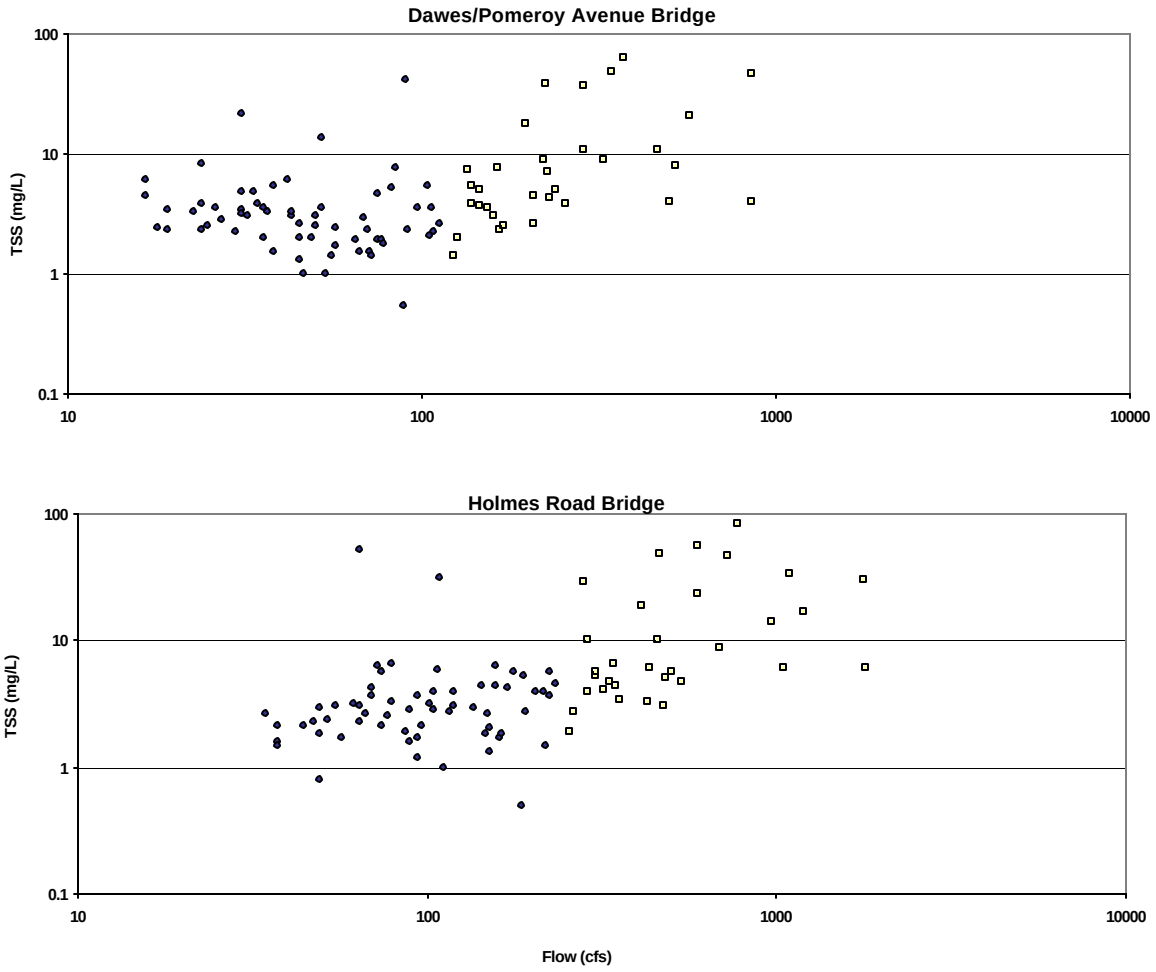
FIGURE 3-4



Notes:

1. TSS = total suspended solids.
2. mg/L = milligrams per liter.
3. cfs = cubic feet per second.
4. Presents data collected by GE (1996-2002) and EPA (1998-1999).
5. Flow at each location based on location specific drainage basin proation of flows measured at Coltsville.

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RELATIONSHIP OF TSS CONCENTRATION AND FLOW IN HOUSATONIC RIVER SURFACE WATER SAMPLES

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FIGURE
3-6a

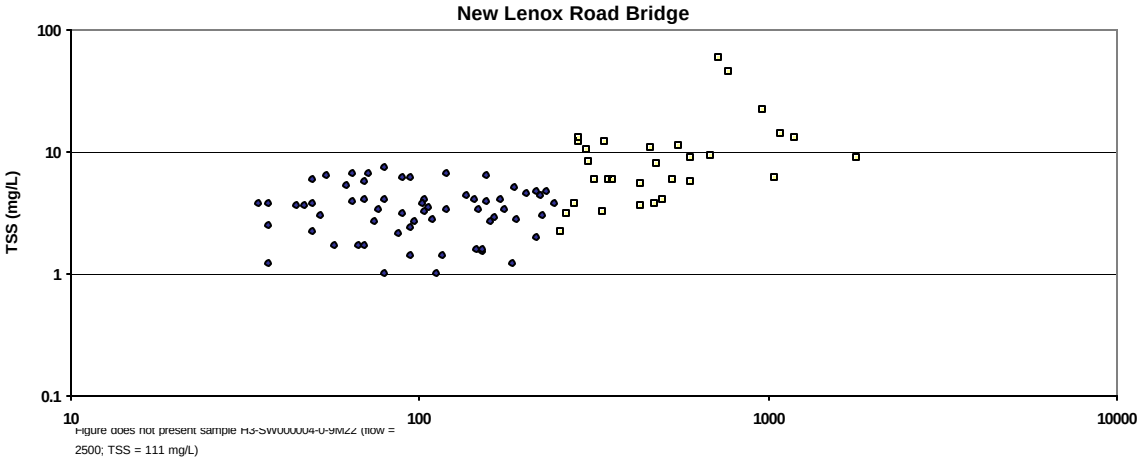
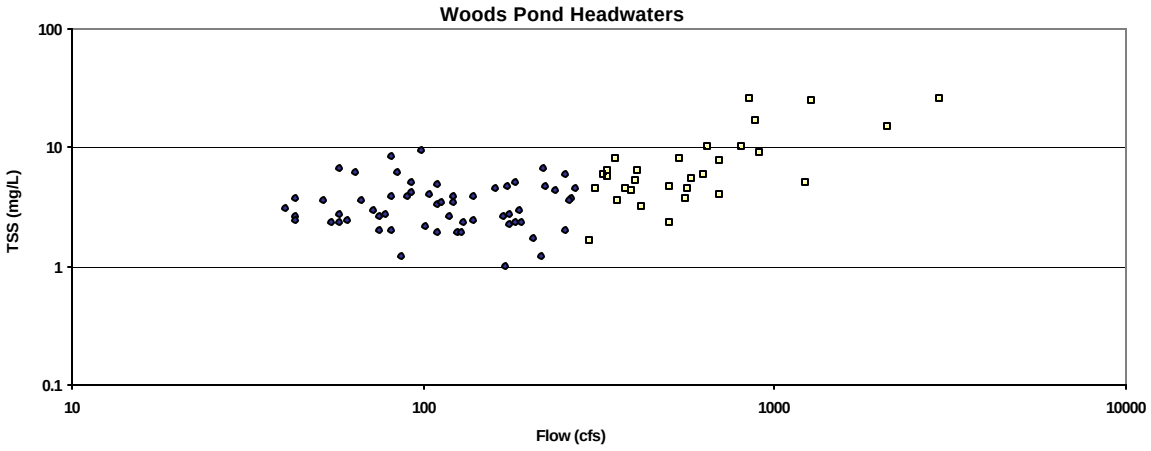


Figure does not present sample R3-SW000004-0-9M22 (flow = 2500; TSS = 111 mg/L)



- Flow < 100 cfs at Coltsville
- Flow > 100 cfs at Coltsville

Notes:

1. TSS = total suspended solids.
2. mg/L = milligrams per liter.
3. cfs = cubic feet per second.
4. Presents data collected by GE (1996-2002) and EPA (1998-1999).
5. Flow at each location based on location specific drainage basin proation of flows measured at Coltsville.

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RELATIONSHIP OF TSS CONCENTRATION AND FLOW IN HOUSATONIC RIVER SURFACE WATER SAMPLES

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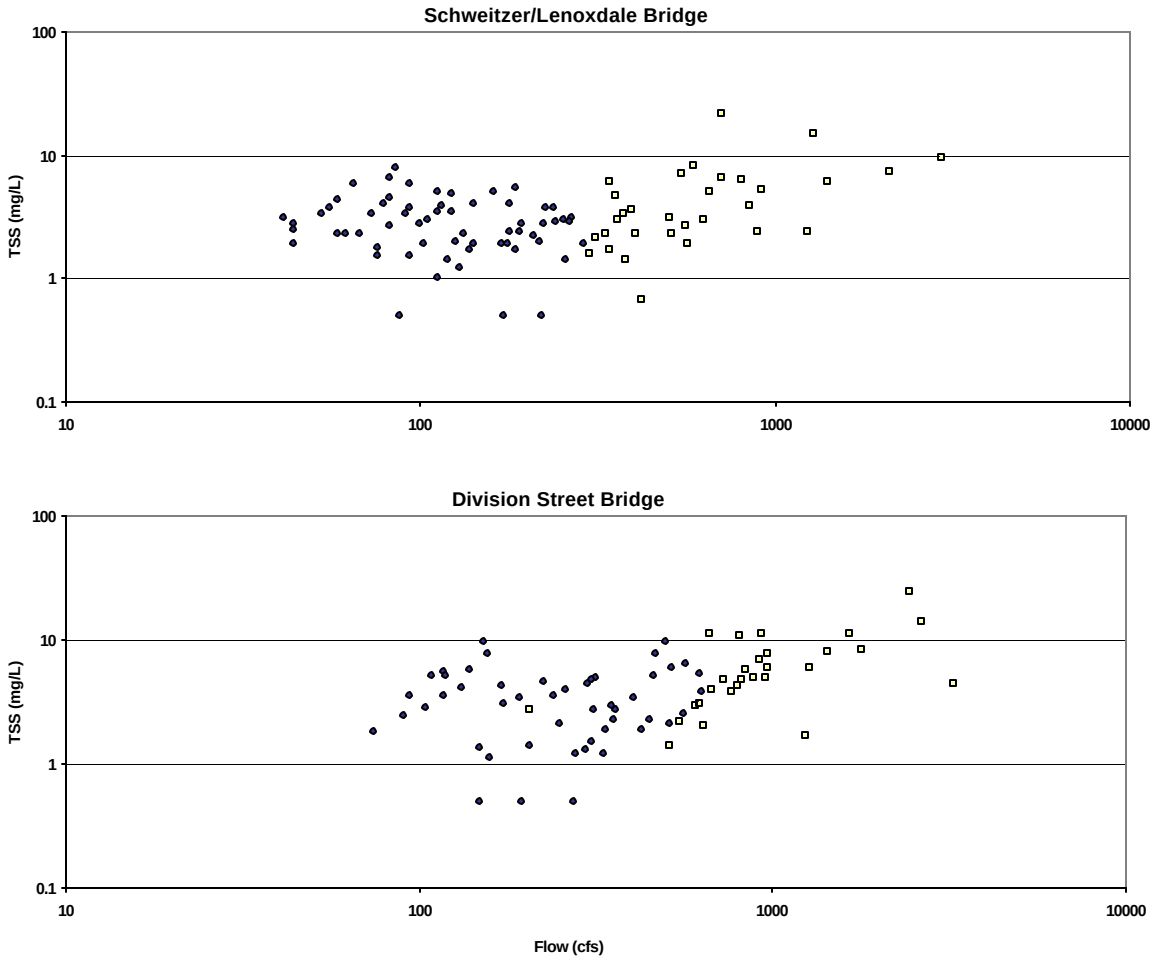
FIGURE
3-6b



- Flow < 100 cfs at Coltsville
- Flow > 100 cfs at Coltsville

Notes:

1. TSS = total suspended solids.
2. mg/L = milligrams per liter.
3. cfs = cubic feet per second.
4. Presents data collected by GE (1996-2002) and EPA (1998-1999).
5. Flow at each location based on location specific drainage basin proation of flows measured at Coltsville.

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RELATIONSHIP OF TSS CONCENTRATION AND FLOW IN HOUSATONIC RIVER SURFACE WATER SAMPLES

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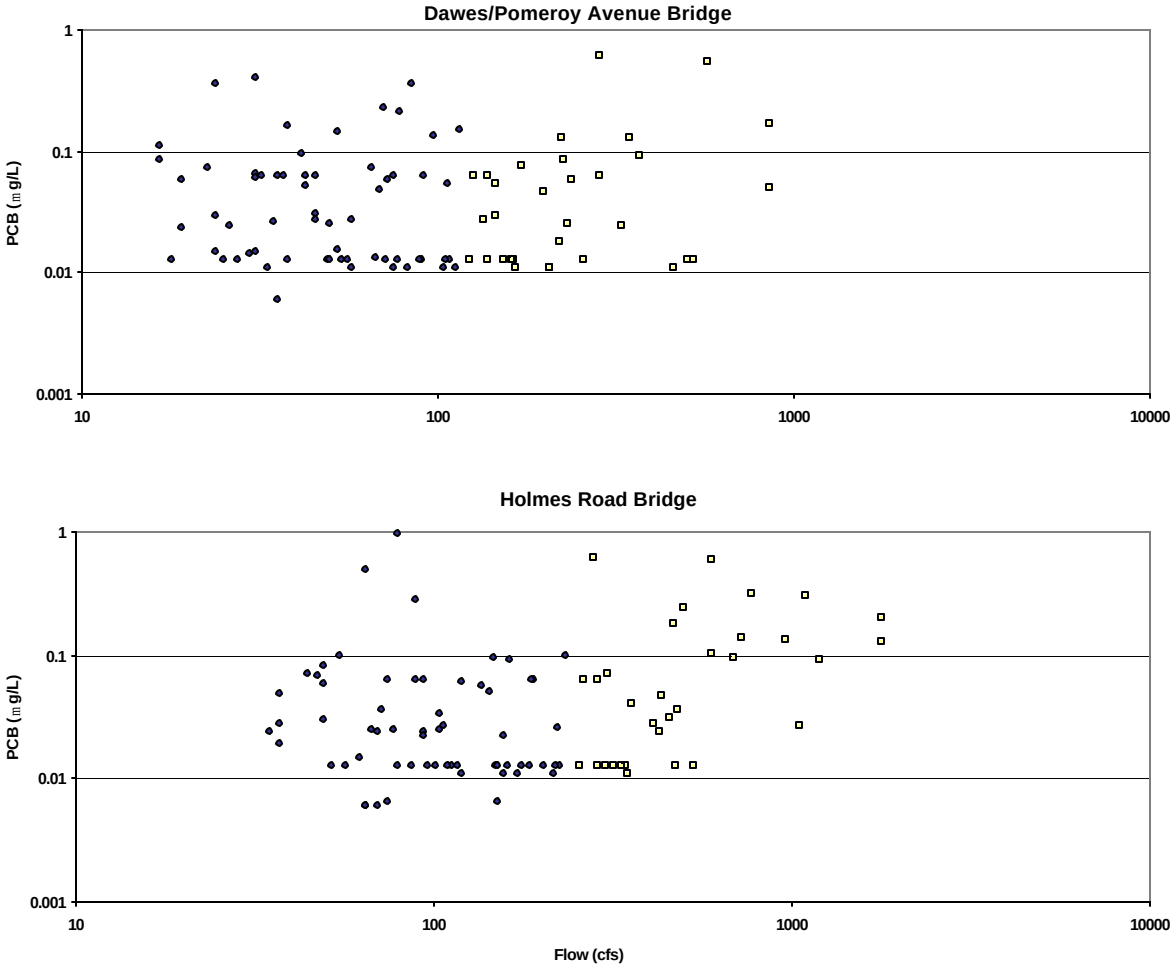
FIGURE 3-6c



Notes:

1. PCB = polychlorinated biphenyls.
2. µg/L = micrograms per liter.
3. cfs = cubic feet per second.
4. Presents data collected by GE (1996-2002) and EPA (1998-1999).
5. Flow at each location based on location specific drainage basin proation of flows measured at Coltsville.

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RELATIONSHIP OF PCB CONCENTRATION AND FLOW IN HOUSATONIC RIVER SURFACE WATER SAMPLES

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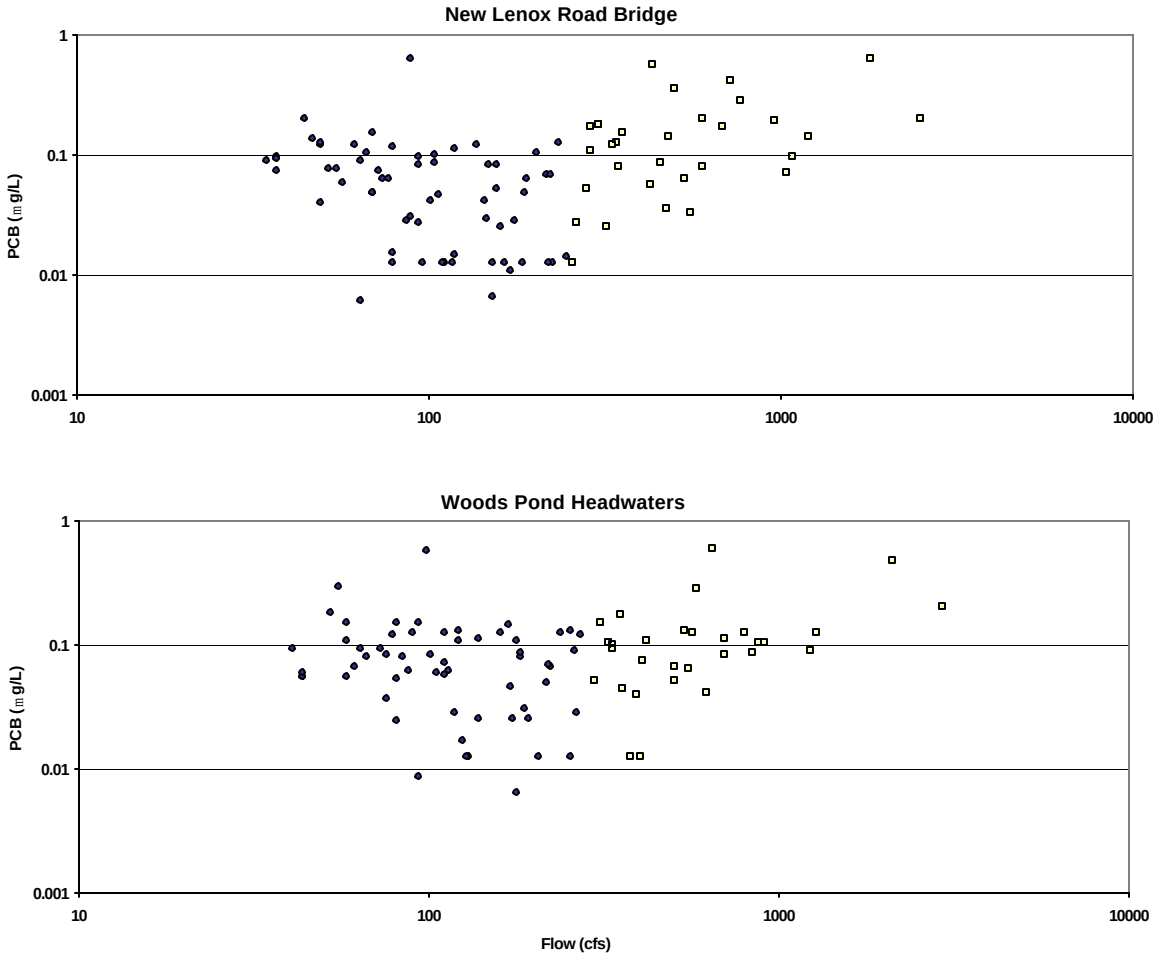
FIGURE 3-9a



Notes:

1. PCB = polychlorinated biphenyls.
2. µg/L = micrograms per liter.
3. cfs = cubic feet per second.
4. Presents data collected by GE (1996-2002) and EPA (1998-1999).
5. Flow at each location based on location specific drainage basin proation of flows measured at Coltsville.

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RELATIONSHIP OF PCB CONCENTRATION TO FLOW FOR HOUSATONIC RIVER SURFACE WATER SAMPLES

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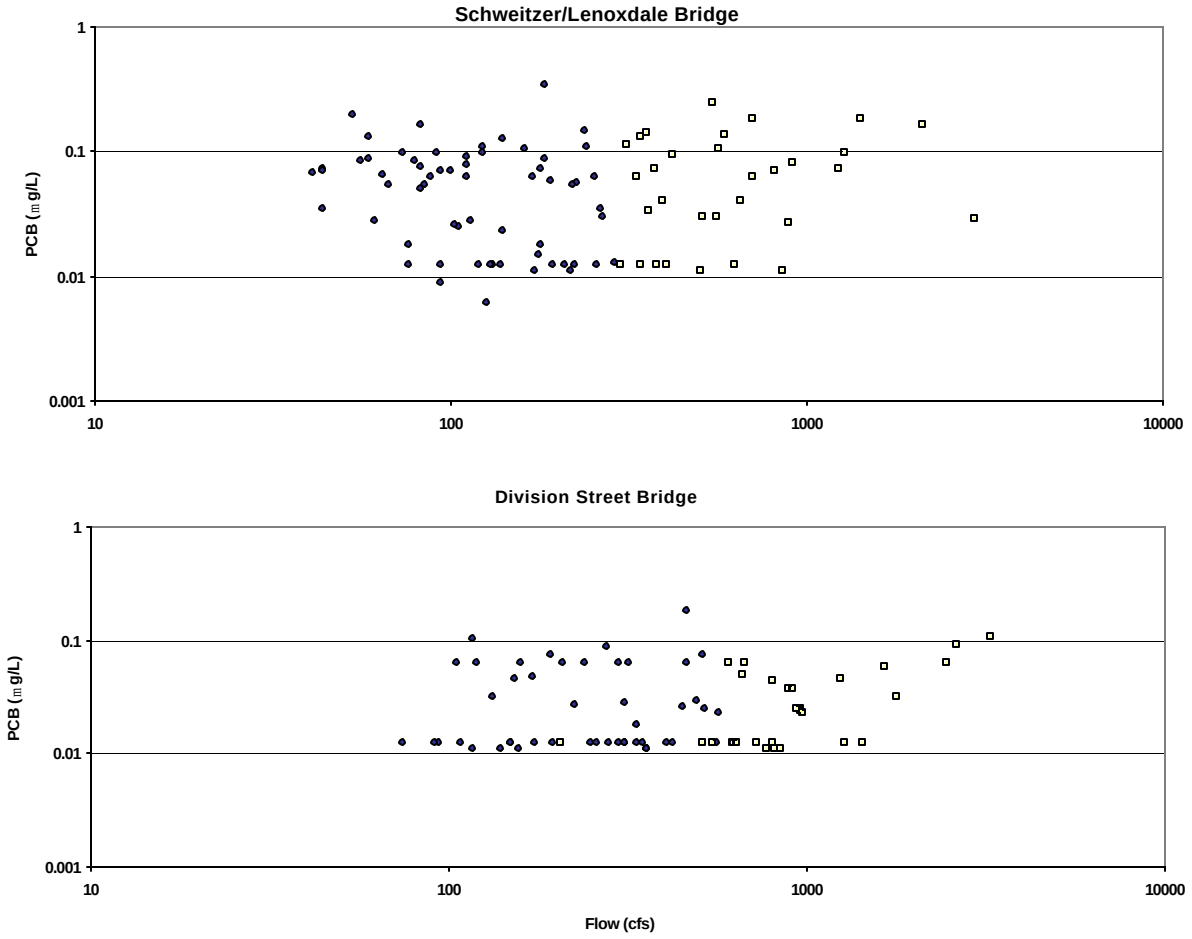
FIGURE 3-9b



Notes:

1. PCB = polychlorinated biphenyls.
2. µg/L = micrograms per liter.
3. cfs = cubic feet per second.
4. Presents data collected by GE (1996-2002) and EPA (1998-1999).
5. Flow at each location based on location specific drainage basin proation of flows measured at Coltsville.

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RELATIONSHIP OF PCB CONCENTRATION AND FLOW IN HOUSATONIC RIVER SURFACE WATER SAMPLES

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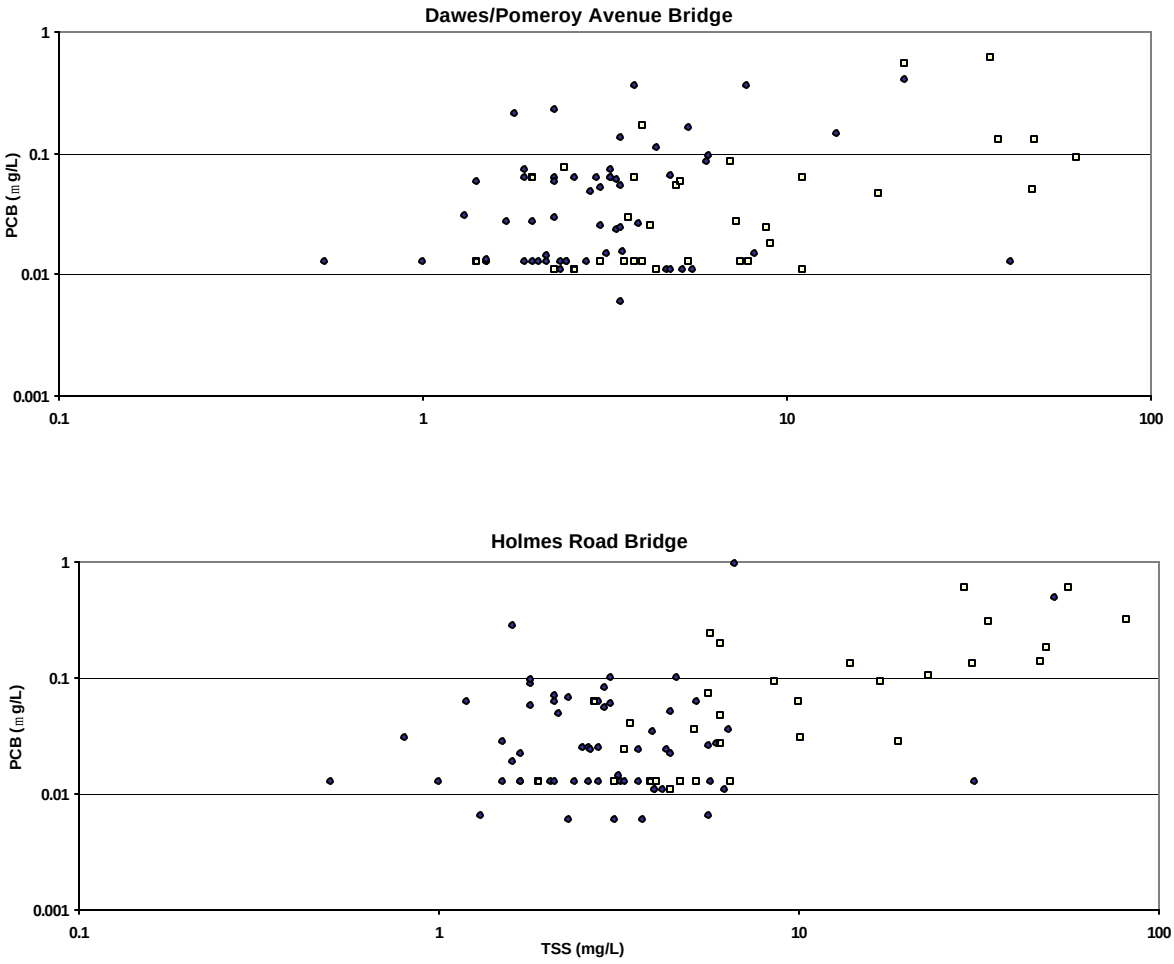
FIGURE 3-9c



Notes:

1. PCB = polychlorinated biphenyls .
2. µg/L = micrograms per liter.
3. TSS = total suspended solids
4. mg/L = milligrams per liter.
5. Presents data collected by GE (1996-2002) and EPA (1998-1999).

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RELATIONSHIP OF PCB AND TSS CONCENTRATION IN HOUSATONIC RIVER SURFACE WATER SAMPLES

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FIGURE 3-11a

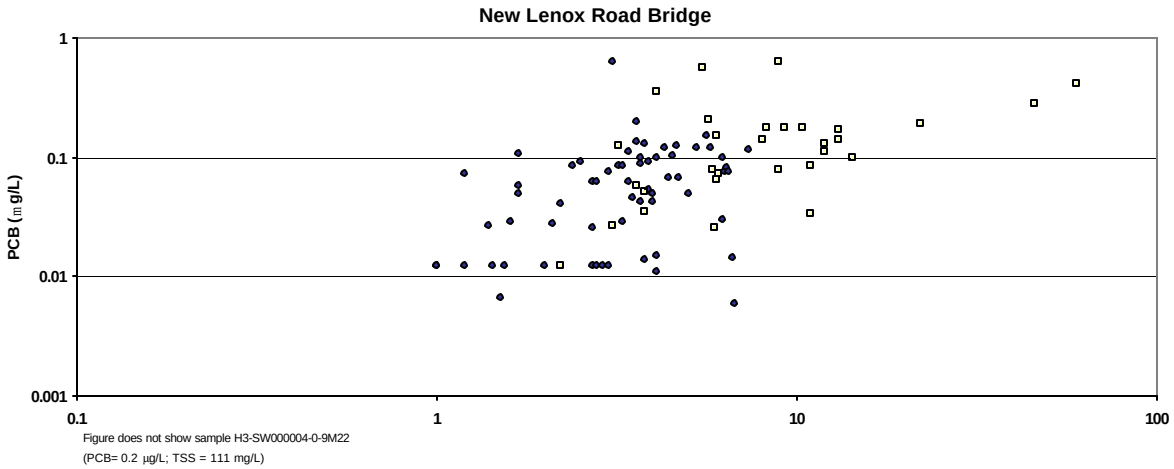
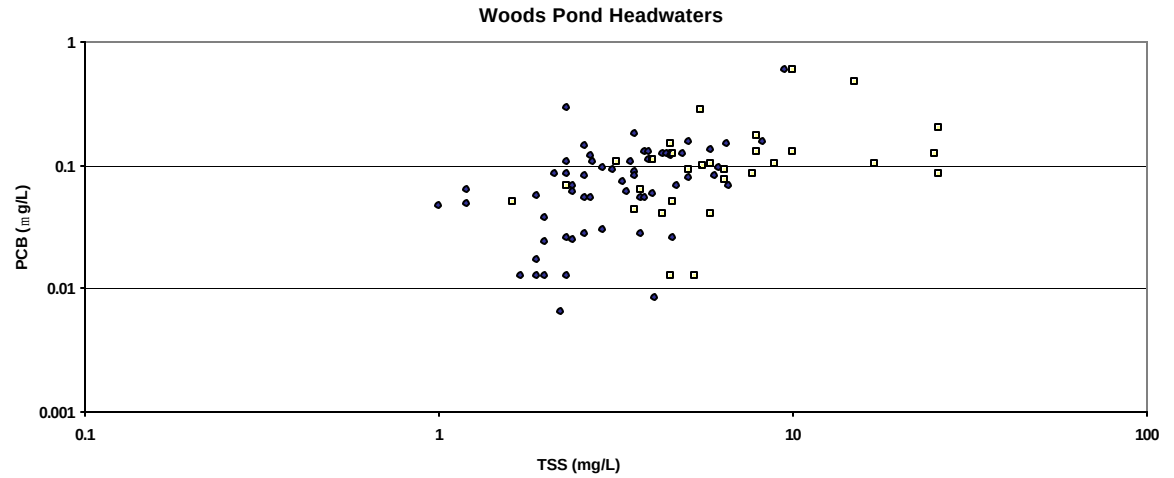


Figure does not show sample H3-SW000004-0-9M22
(PCB= 0.2 µg/L; TSS = 111 mg/L)



- Flow < 100 cfs at Coltsville
- Flow > 100 cfs at Coltsville

Notes:
1. PCB = polychlorinated biphenyls.
2. µg/L = micrograms per liter.
3. TSS = total suspended solids.
4. mg/L = milligrams per liter.
5. Presents data collected by GE (1996-2002) and EPA (1998-1999).

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RELATIONSHIP OF PCB AND TSS CONCENTRATION IN HOUSATONIC RIVER SURFACE WATER SAMPLES

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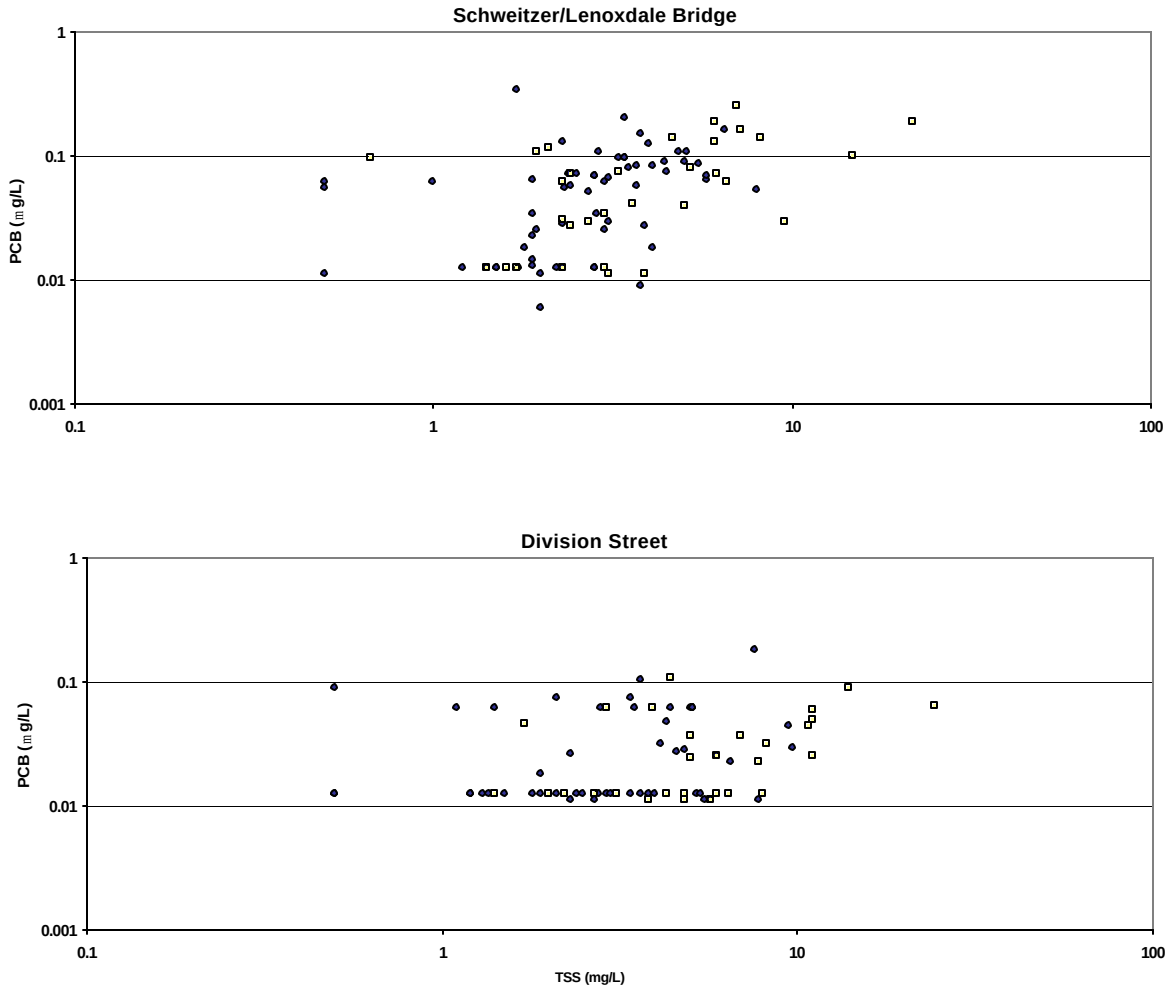
FIGURE 3-11b



Notes:

1. PCB = polychlorinated biphenyls.
2. µg/L = micrograms per liter.
3. TSS = total suspended solids.
4. mg/L = milligrams per liter.
5. Presents data collected by GE (1996-2002) and EPA (1998-1999).

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RELATIONSHIP OF PCB AND TSS CONCENTRATION IN HOUSATONIC RIVER SURFACE WATER SAMPLES

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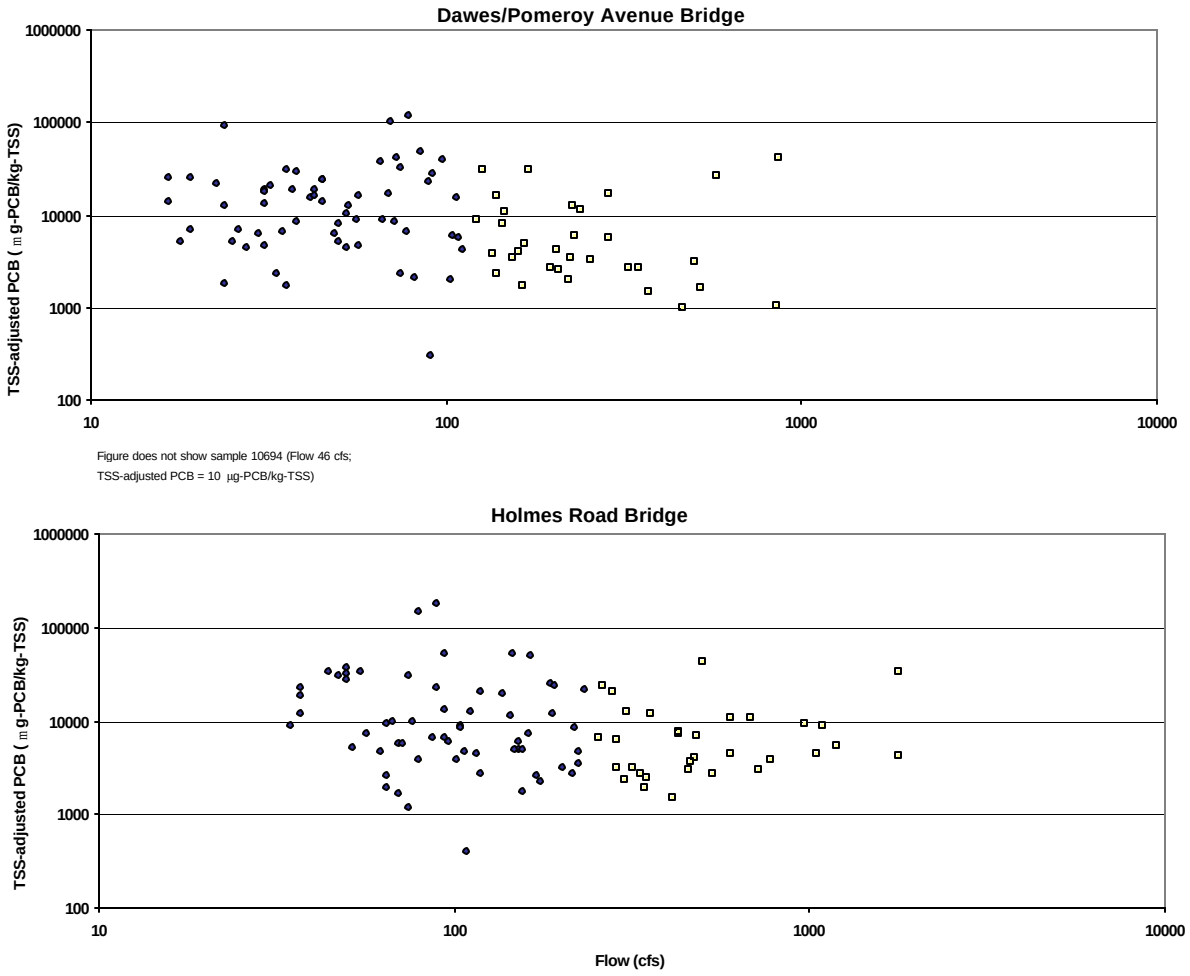
FIGURE 3-11c



Notes:

1. TSS = total suspended solids.
2. PCB = polychlorinated biphenyls.
3. µg = micrograms.
4. g = grams.
5. cfs = cubic feet per second.
6. Presents data collected by GE (1996-2002) and EPA (1998-1999).
7. Flow at each location based on location specific drainage basin proation of flows measured at Coltsville.

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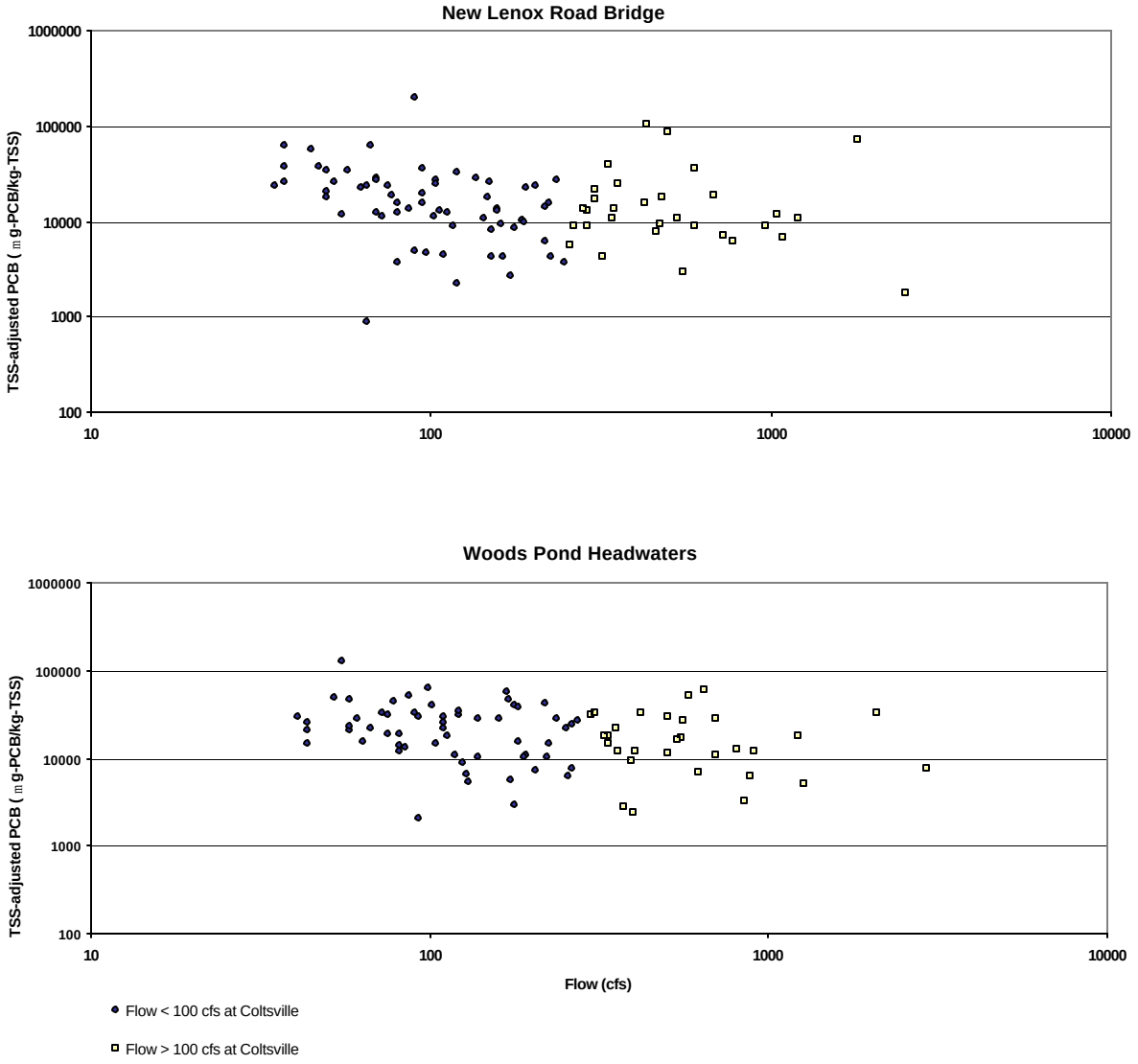
RELATIONSHIP OF TSS-ADJUSTED PCB CONCENTRATION AND FLOW IN HOUSATONIC RIVER SURFACE WATER SAMPLES

BBL® BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE 3-12a



Notes:

1. TSS = total suspended solids.
2. PCB = polychlorinated biphenyls.
3. µg = micrograms.
4. g = grams.
5. cfs = cubic feet per second.
6. Presents data collected by GE (1996-2002) and EPA (1998-1999).
7. Flow at each location based on location specific drainage basin proation of flows measured at Coltsville.

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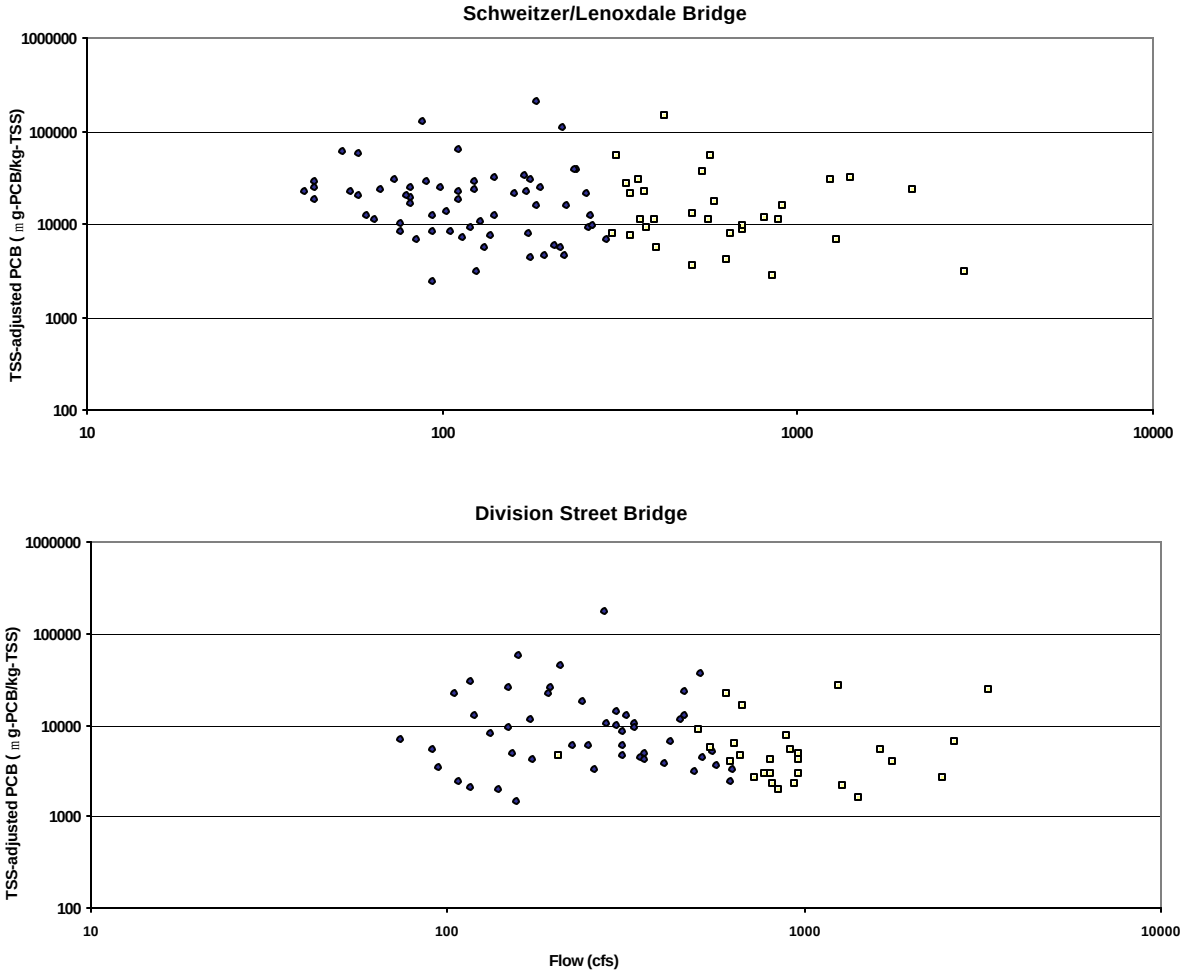
FIGURE
3-12b



Notes:

1. TSS = total suspended solids.
2. PCB = polychlorinated biphenyls.
3. µg = micrograms.
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5. cfs = cubic feet per second.
6. Presents data collected by GE (1996-2002) and EPA (1998-1999).
7. Flow at each location based on location specific drainage basin proation of flows measured at Coltsville.

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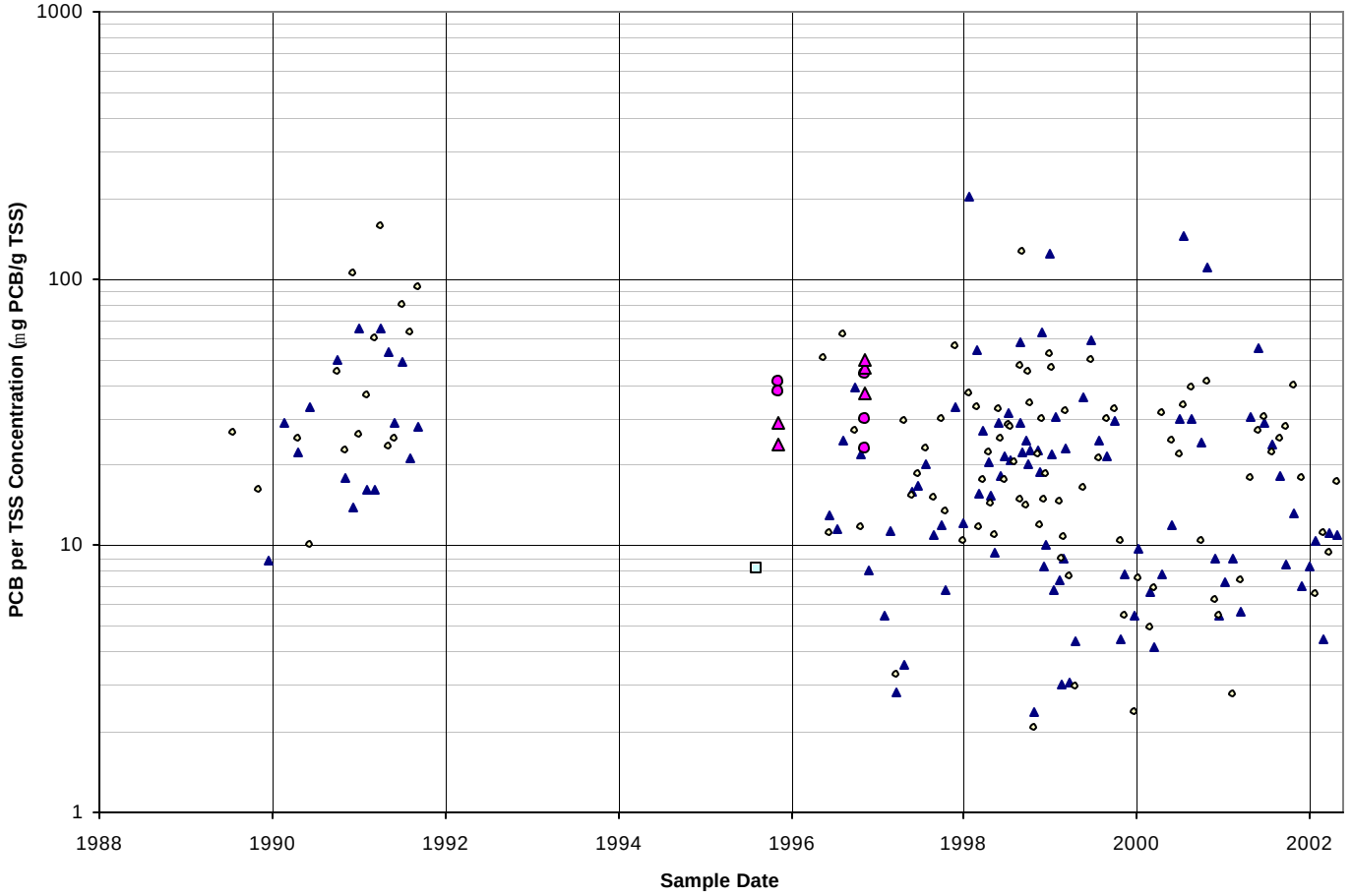
FIGURE
3-12c



▲ Schweitzer/Lenoxdale Bridge

◦ Woods Pond Headwaters

● GE Suspended Sediment Sampling at Woods Pond Headwaters

□ Woods Pond Sediment Trap

Notes:

1. The PCB per TSS concentraion for the monthly monitoring data is represented by the TSS-adjusted PCB concentrauion.
2. PCB = polychlorinated biphenyls.
3. TSS = total suspended solids.
4. µg = micrograms.
5. g = grams.

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PCB PER TSS CONCENTRATION IN THE VICINITY OF WOODS POND

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FIGURE 3-13

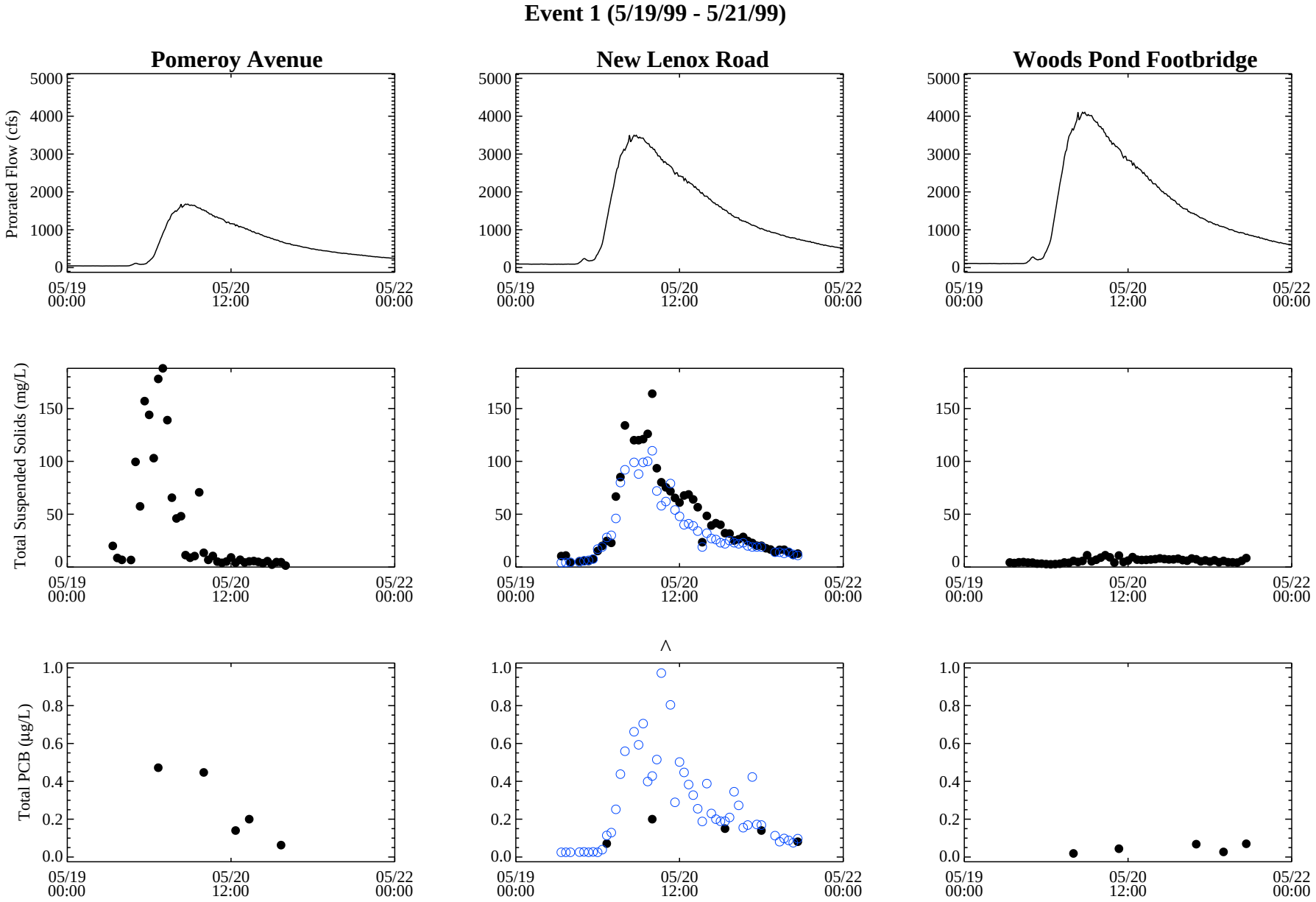


Figure 3-14a. PCB and TSS concentrations measured during 1999 USEPA storm event sampling

Notes: Flow at each location estimated based on drainage area proration; USEPA TSS data shown were collected using ISCO sampler.

WK - J:\GENhou\documents\reports\RFI_report\Section3\figures\storm_EPA_GE_combined.pro
Thu Jan 02 10:06:55 2003

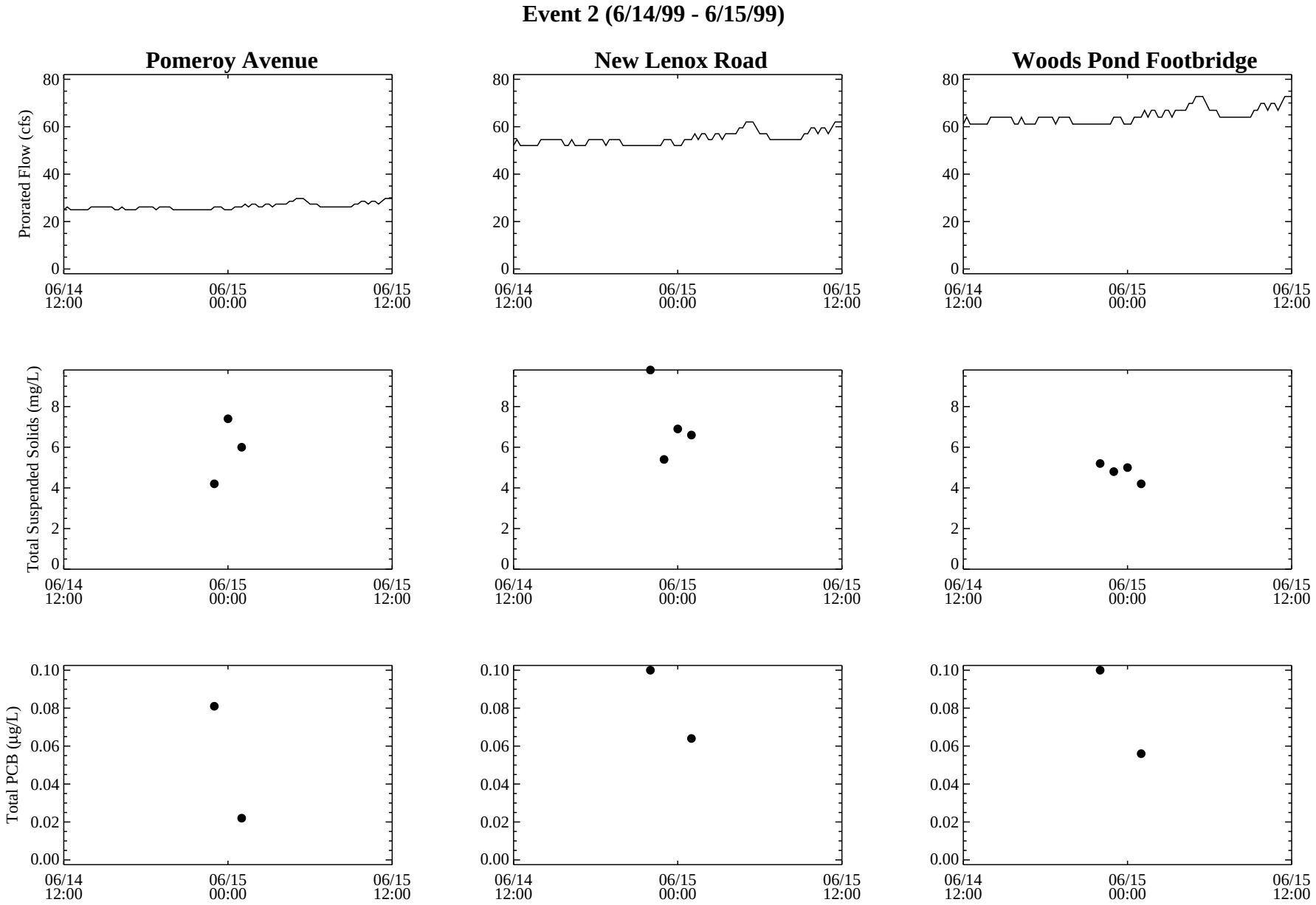


Figure 3-14b. PCB and TSS concentrations measured during 1999 USEPA storm event sampling

Notes: Flow at each location estimated based on drainage area proration; USEPA TSS data shown were collected using ISCO sampler.

WK - J:\GENhou\documents\reports\RFI_report\Section3\figures\storm_EPA_GE_combined.pro
Thu Jan 02 10:06:55 2003

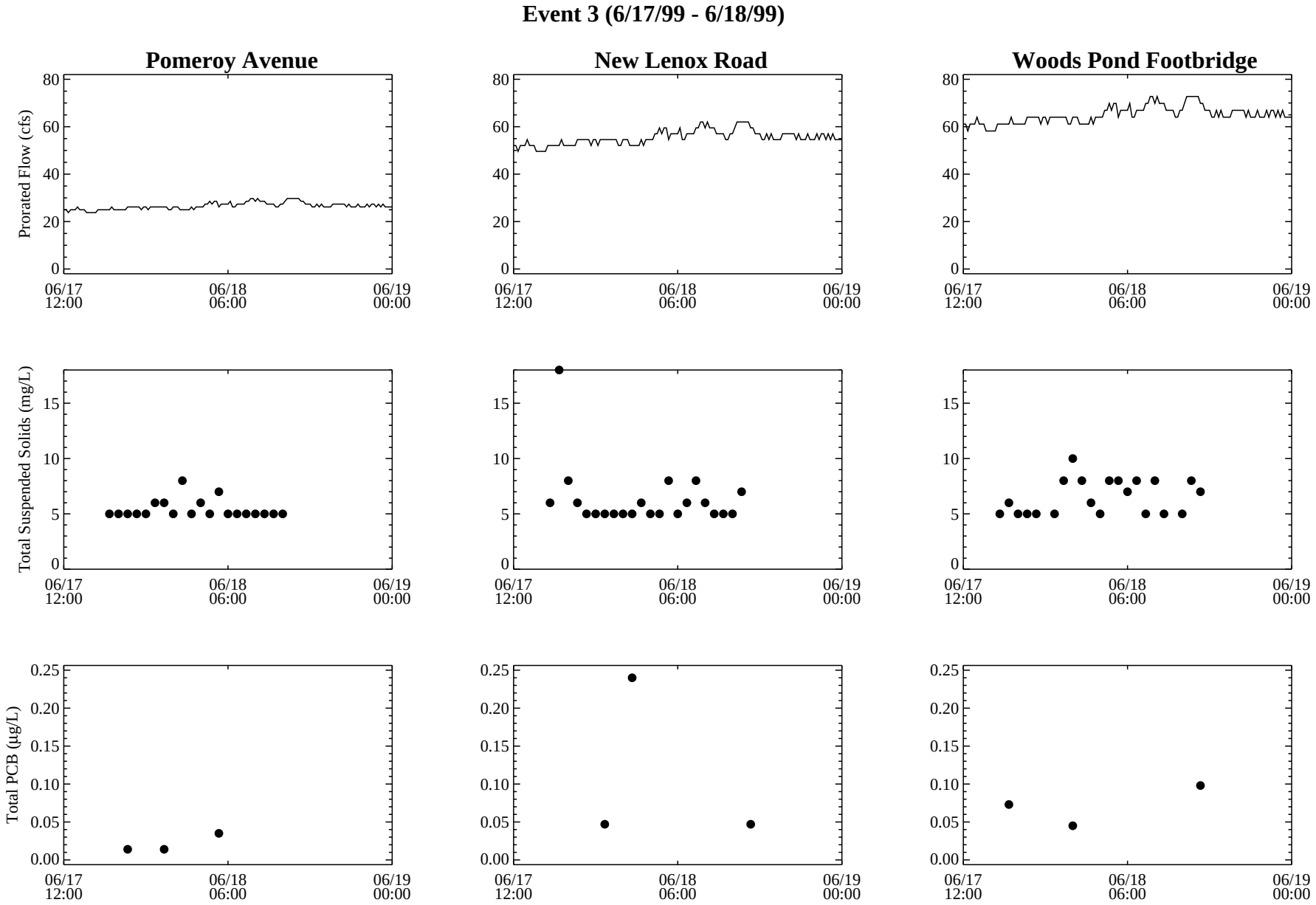


Figure 3-14c. PCB and TSS concentrations measured during 1999 USEPA storm event sampling

Notes: Flow at each location estimated based on drainage area proration; USEPA TSS data shown were collected using ISCO sampler.

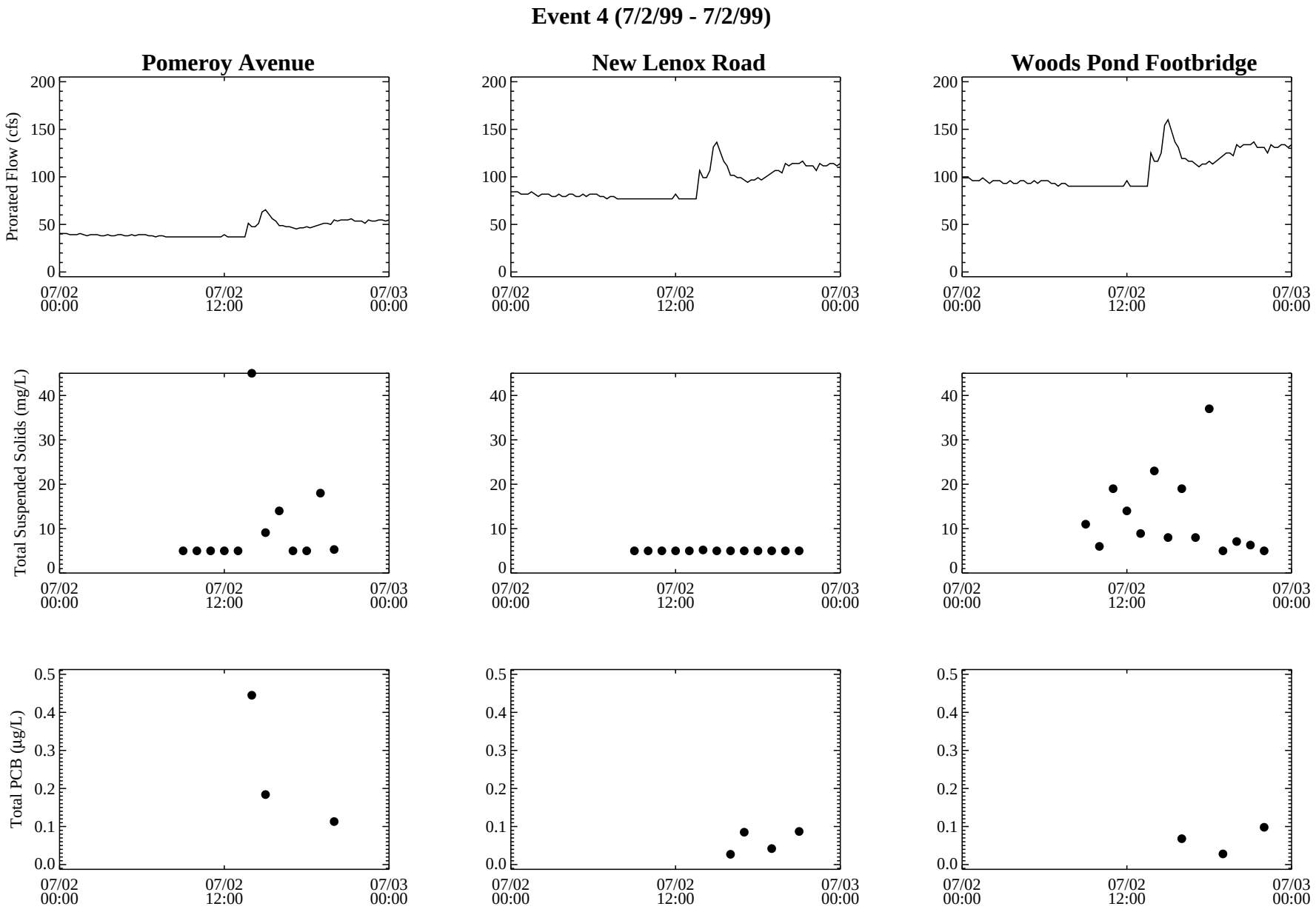


Figure 3-14d. PCB and TSS concentrations measured during 1999 USEPA storm event sampling

Notes: Flow at each location estimated based on drainage area proration; USEPA TSS data shown were collected using ISCO sampler.

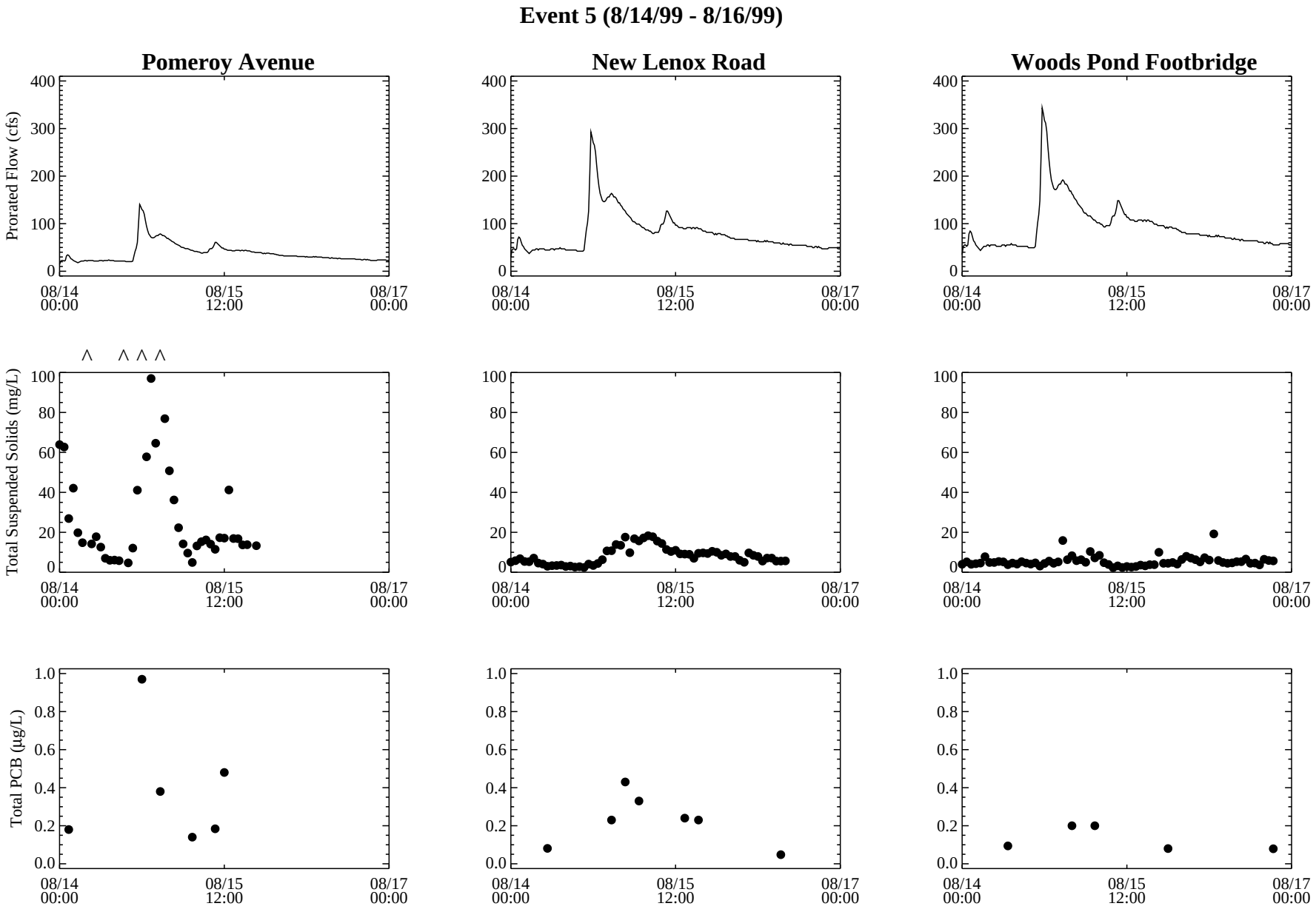


Figure 3-14e. PCB and TSS concentrations measured during 1999 USEPA storm event sampling

Notes: Flow at each location estimated based on drainage area proration; USEPA TSS data shown were collected using ISCO sampler.

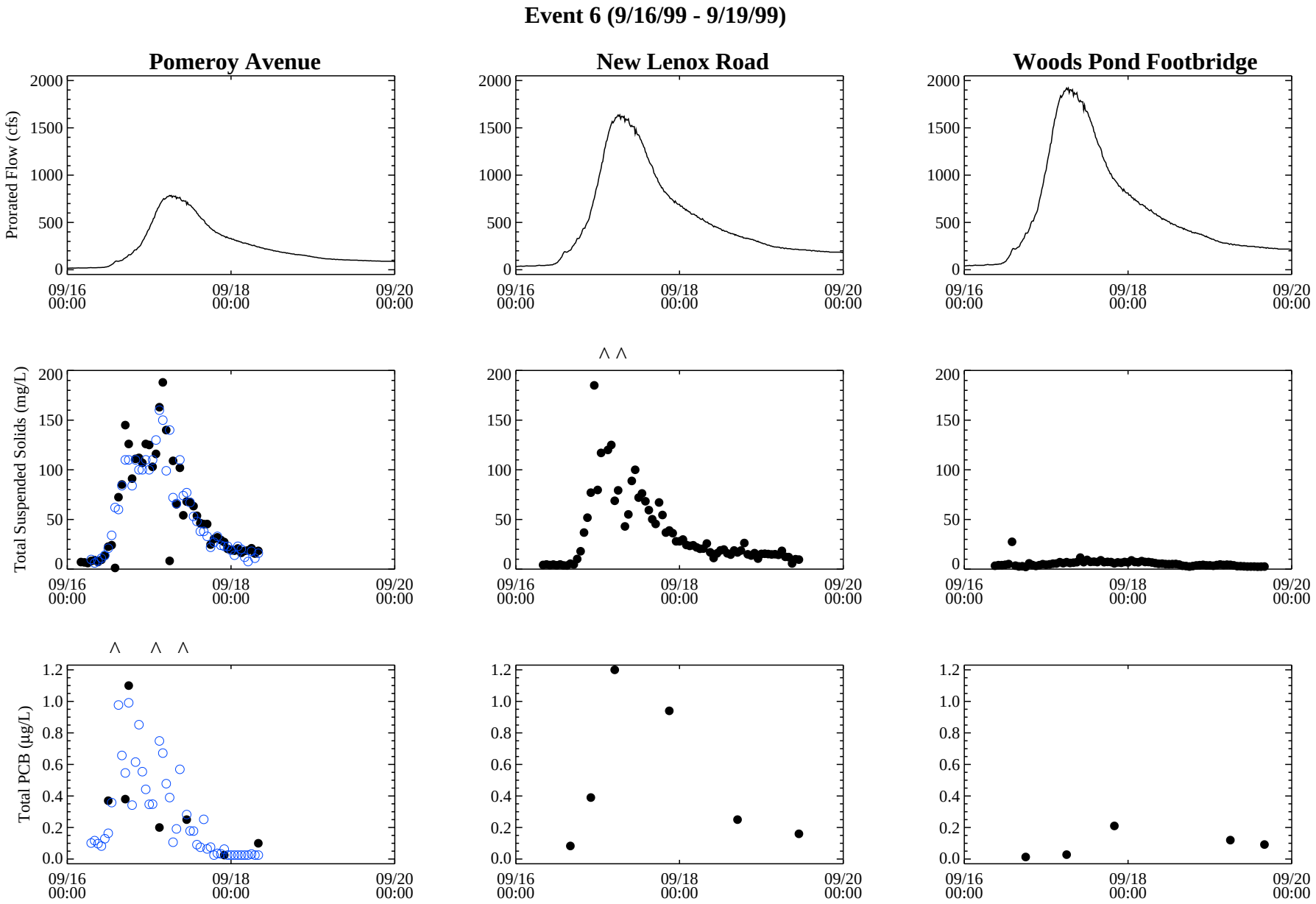


Figure 3-14f. PCB and TSS concentrations measured during 1999 USEPA storm event sampling

Notes: Flow at each location estimated based on drainage area proration; USEPA TSS data shown were collected using ISCO sampler.

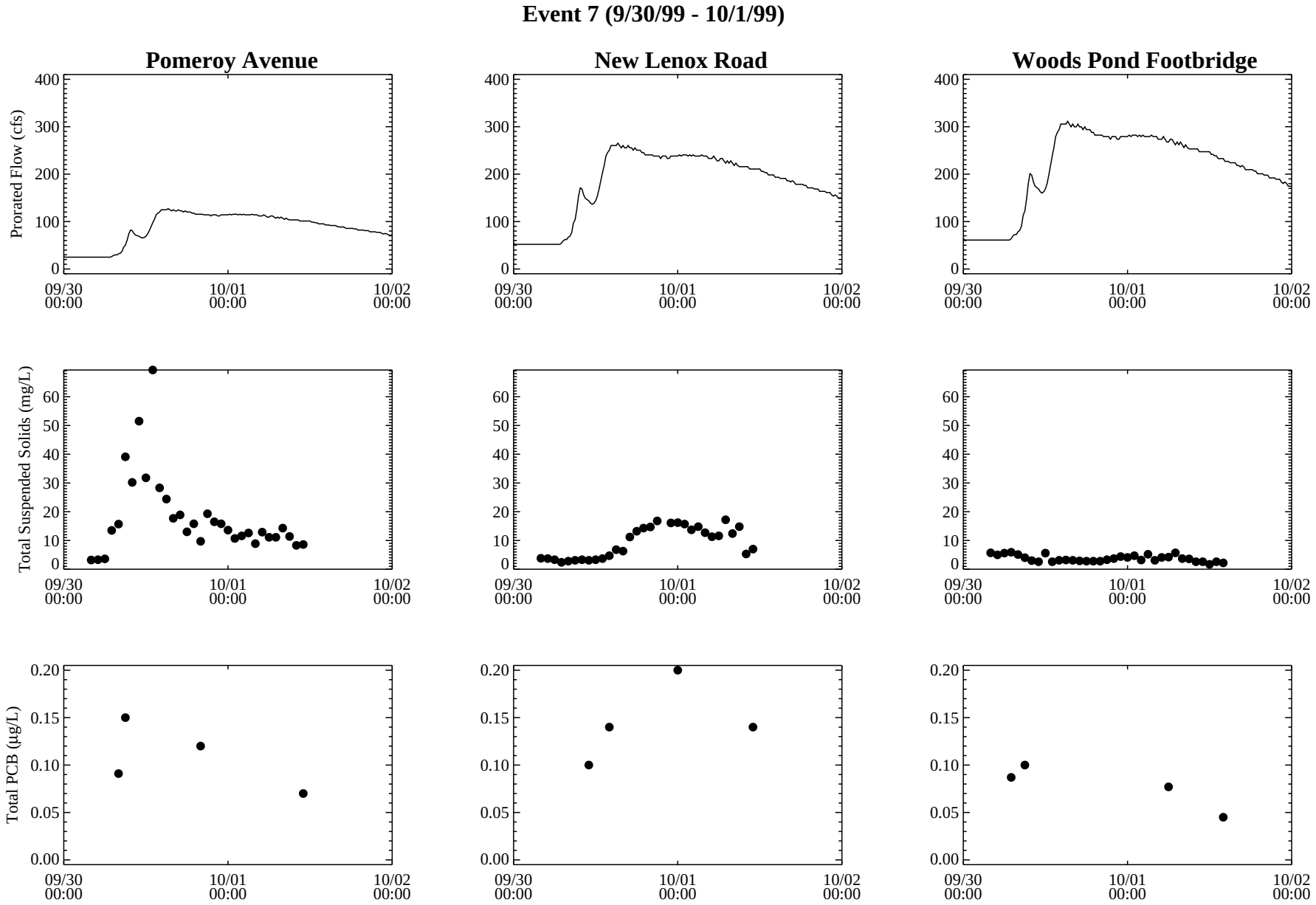
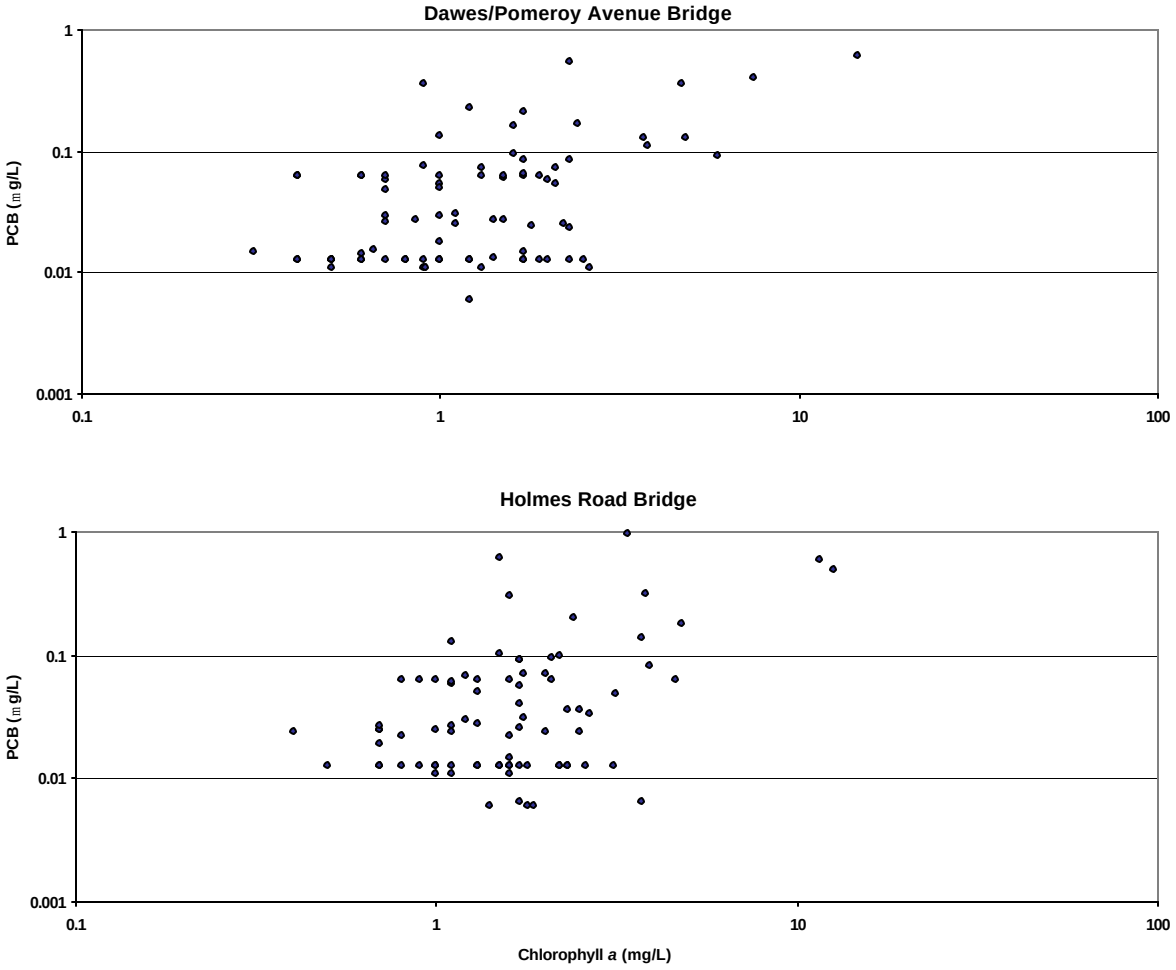


Figure 3-14g. PCB and TSS concentrations measured during 1999 USEPA storm event sampling

Notes: Flow at each location estimated based on drainage area proration; USEPA TSS data shown were collected using ISCO sampler.



Notes:

1. PCB = polychlorinated biphenyls.
2. µg/L = micrograms per liter.
3. mg/L = milligrams per liter.
4. cfs = cubic feet per second.
5. Presents data collected by GE (1996-2002) and EPA (1998-1999).

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RELATIONSHIP OF PCB CONCENTRATION AND CHLOROPHYLL *A* IN HOUSATONIC RIVER SURFACE WATER SAMPLES

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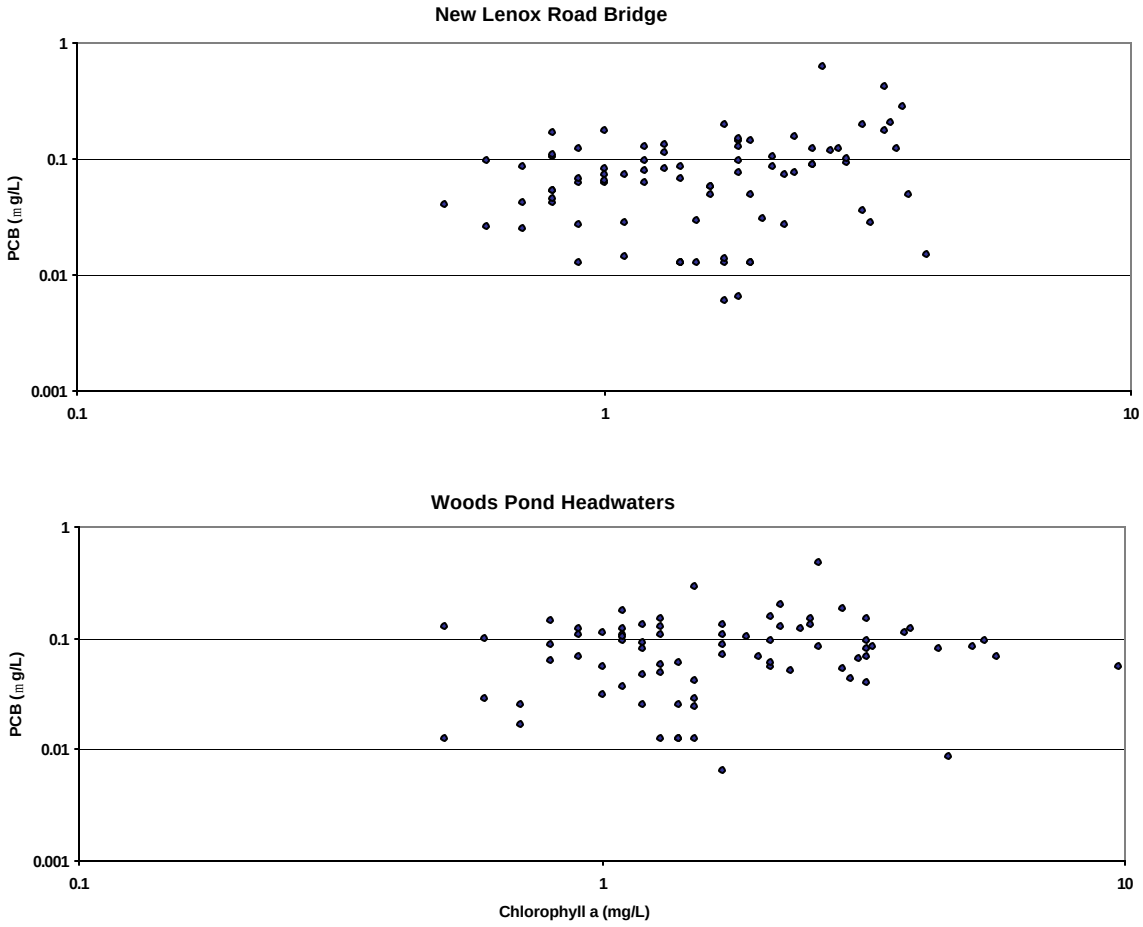
FIGURE 3-17a



Notes:

1. PCB = polychlorinated biphenyls.
2. µg/L = micrograms per liter.
3. mg/L = milligrams per liter.
4. cfs = cubic feet per second.
5. Presents data collected by GE (1996-2002) and EPA (1998-1999).

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RELATIONSHIP OF PCB CONCENTRATION AND CHLOROPHYLL A IN HOUSATONIC RIVER SURFACE WATER SAMPLES

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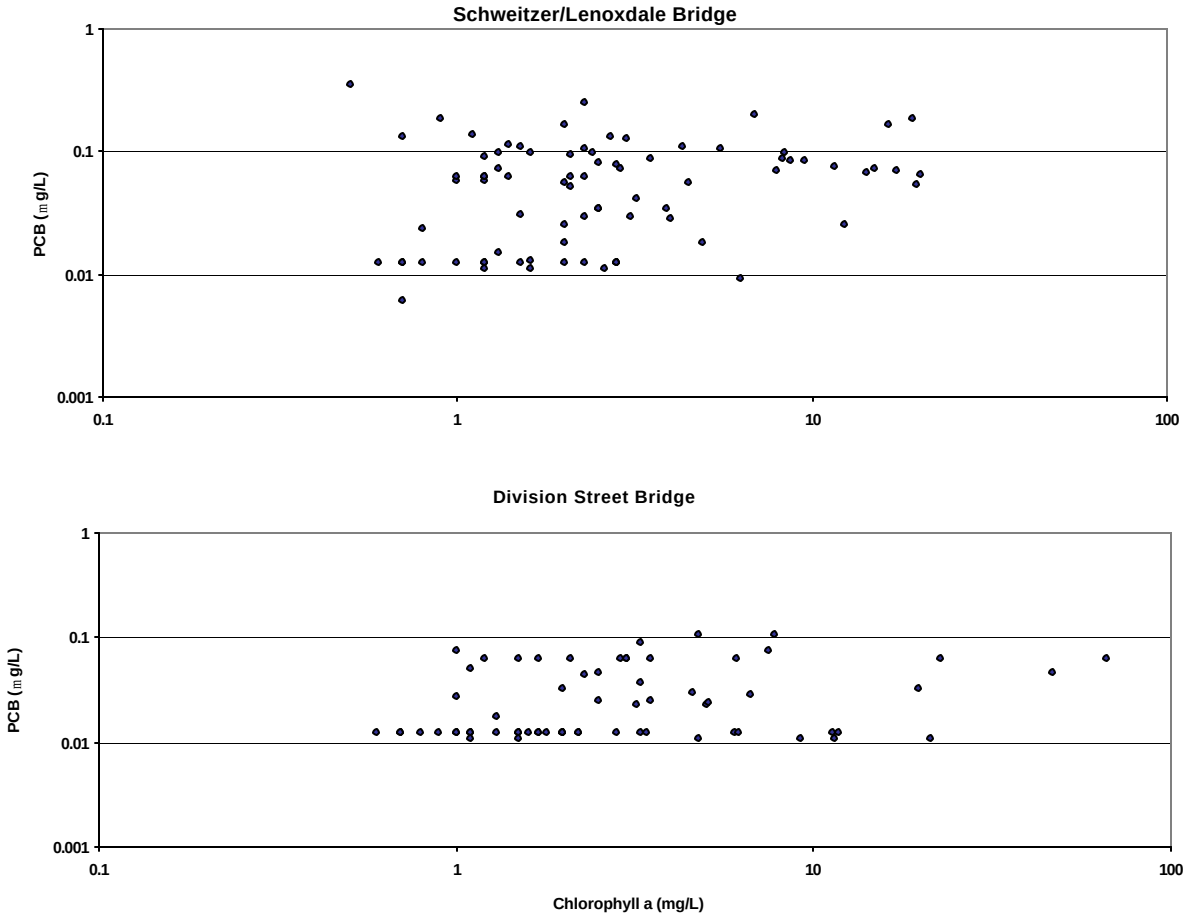
FIGURE
3-17b



Notes:

1. PCB = polychlorinated biphenyls.
2. µg/L = micrograms per liter.
3. mg/L = milligrams per liter.
4. cfs = cubic feet per second.
5. Presents data collected by GE (1996-2002) and EPA (1998-1999).

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RELATIONSHIP OF PCB CONCENTRATION AND CHLOROPHYLL A IN HOUSATONIC RIVER SURFACE WATER SAMPLES

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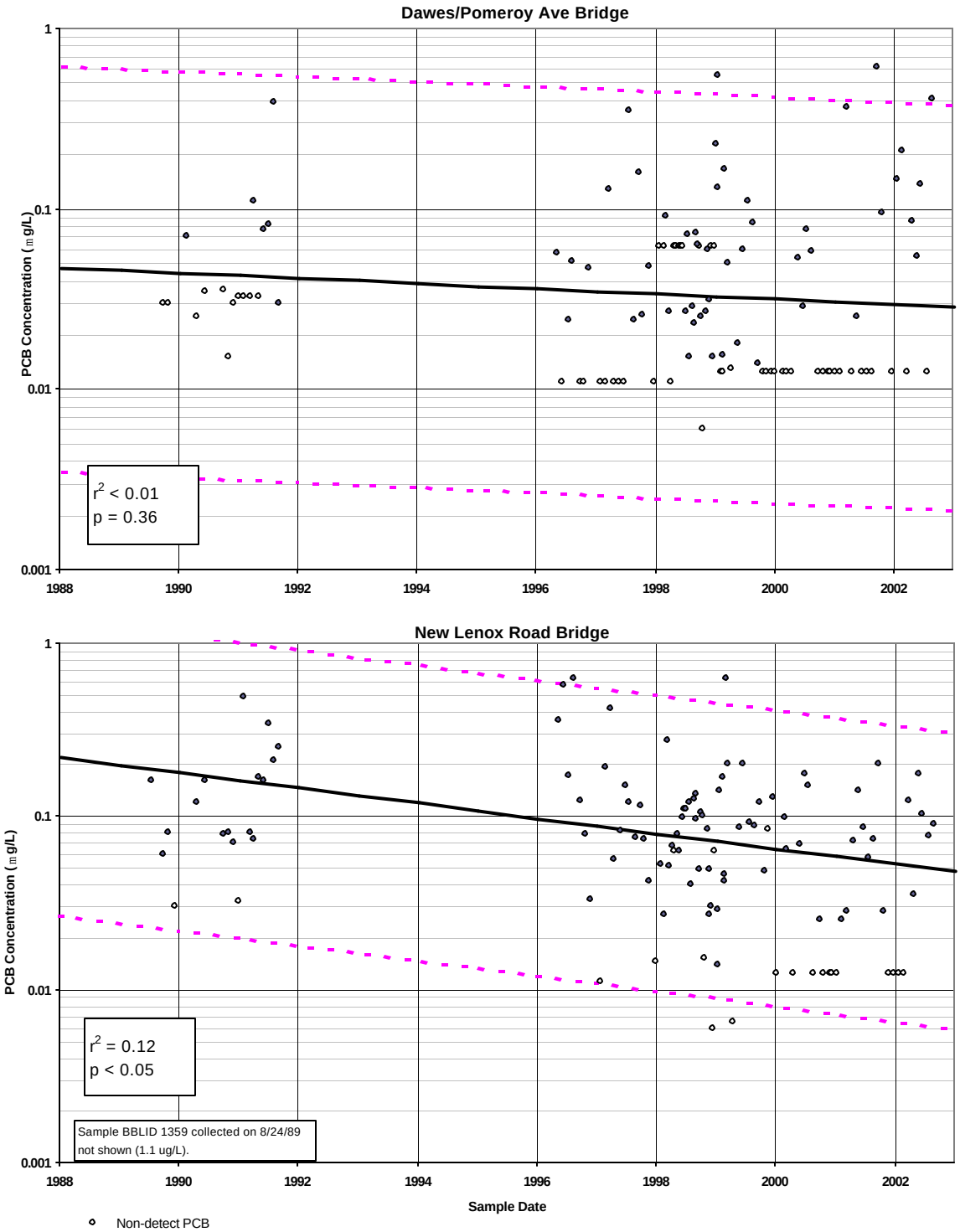
FIGURE
3-17c



Notes:

1. PCB = polychlorinated biphenyls.
2. µg/L = micrograms per liter.
3. Presents all available data collected by GE (1989-2002) and EPA (1998-1999).

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PCB TRENDS IN HOUSATONIC RIVER SURFACE WATER

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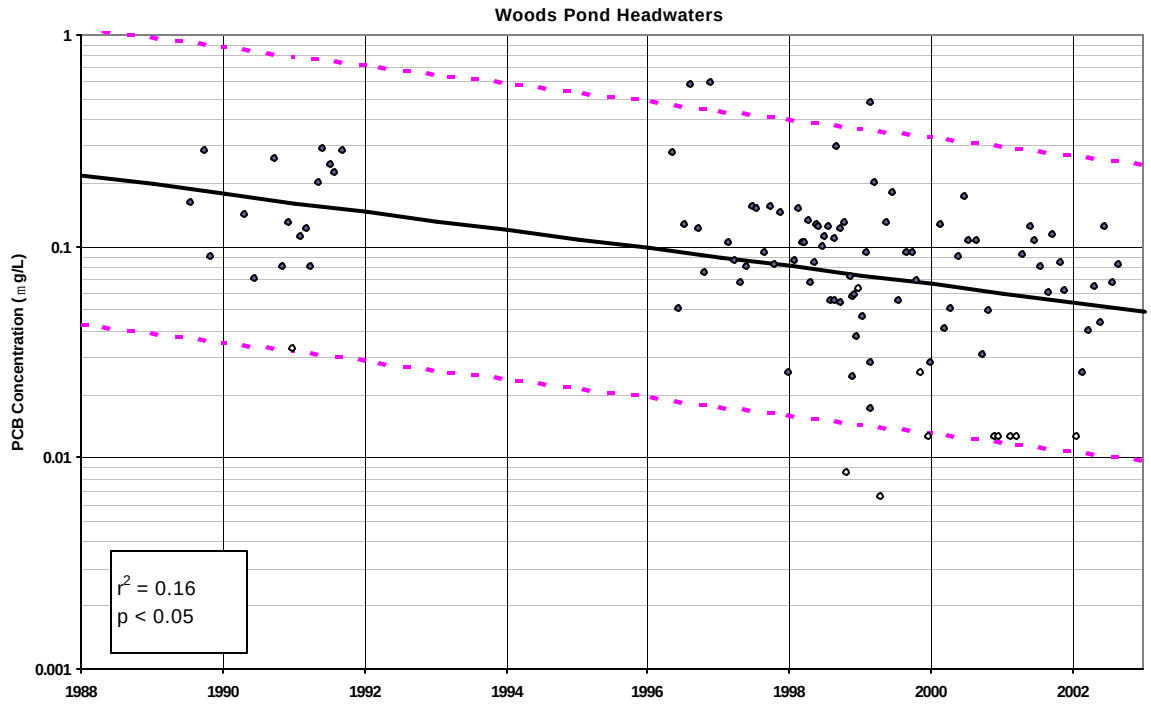
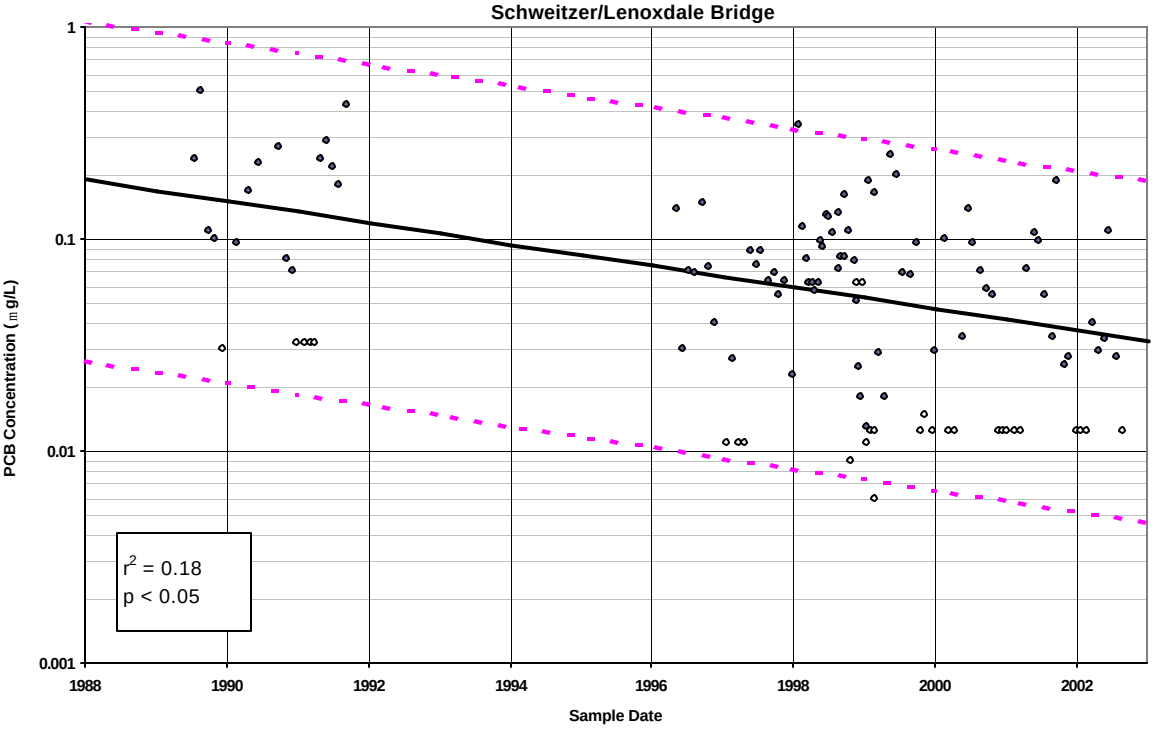
FIGURE 3-18a





Non-detect PCB

Detected PCB

PCB Trend

Notes:

1. PCB = polychlorinated biphenyls.
2. µg/L = micrograms per liter.
3. Presents all available data collected by GE (1989-2002) and EPA (1998-1999).

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PCB TRENDS IN HOUSATONIC RIVER SURFACE WATER

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FIGURE 3-18b

- Non-detect PCB
- Detected PCB
- PCB Trend
- +/- 2 Standard Errors

Notes:

1. PCB = polychlorinated biphenyls.
2. µg/L = micrograms per liter.
3. Presents all available data collected by GE (1989-2002) and EPA (1998-1999).

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PCB TRENDS IN HOUSATONIC RIVER SURFACE WATER

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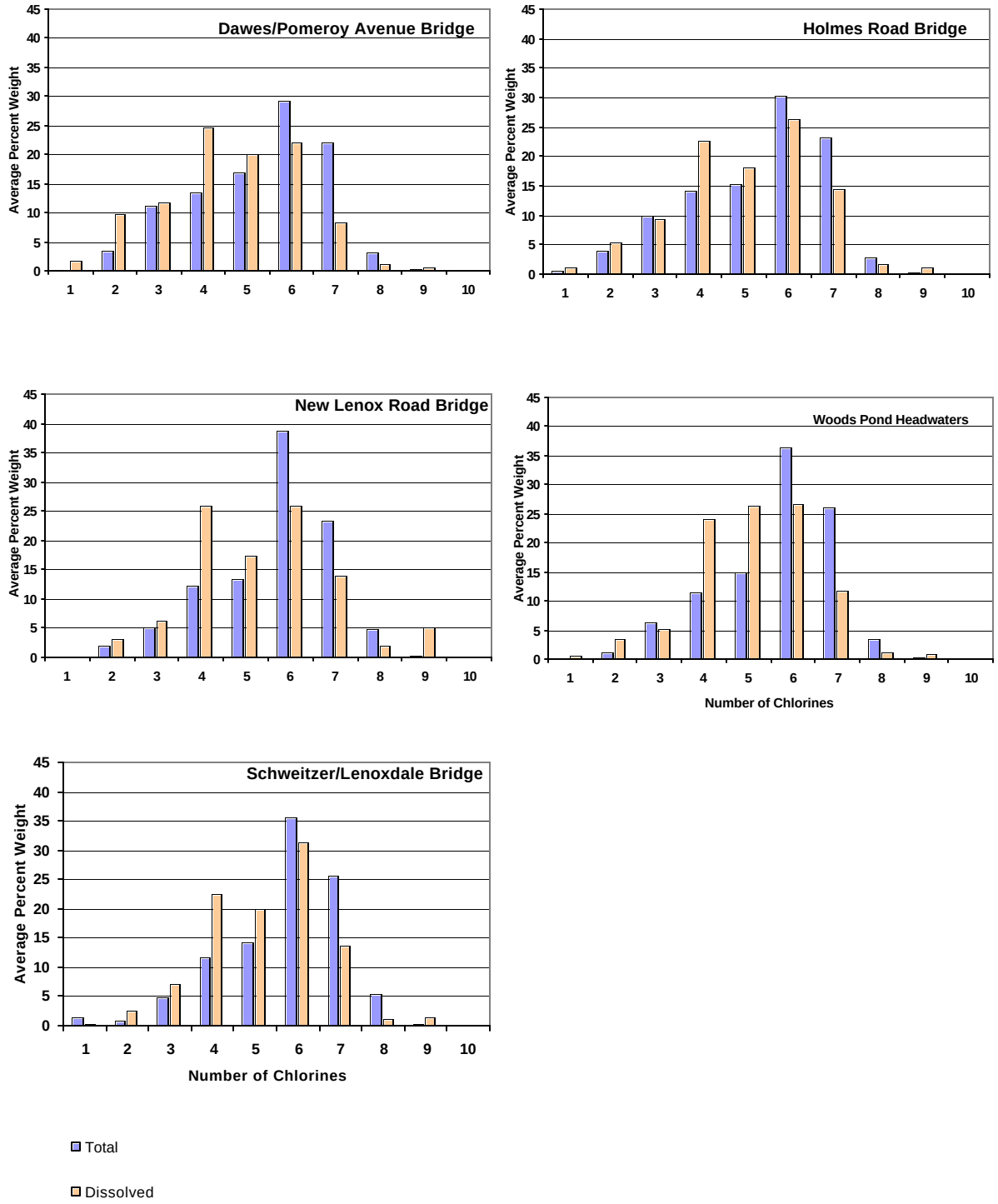
FIGURE 3-18c



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PCB HOMOLOG DISTRIBUTION IN TOTAL AND DISSOLVED WATER COLUMN

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FIGURE 3-20